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AUFWIND

DAS MODELLSPORTMAGA

100 PAGES

10,800 visitors
That was the Prowing

All in wood
The 'Cumul 100' from Kavan

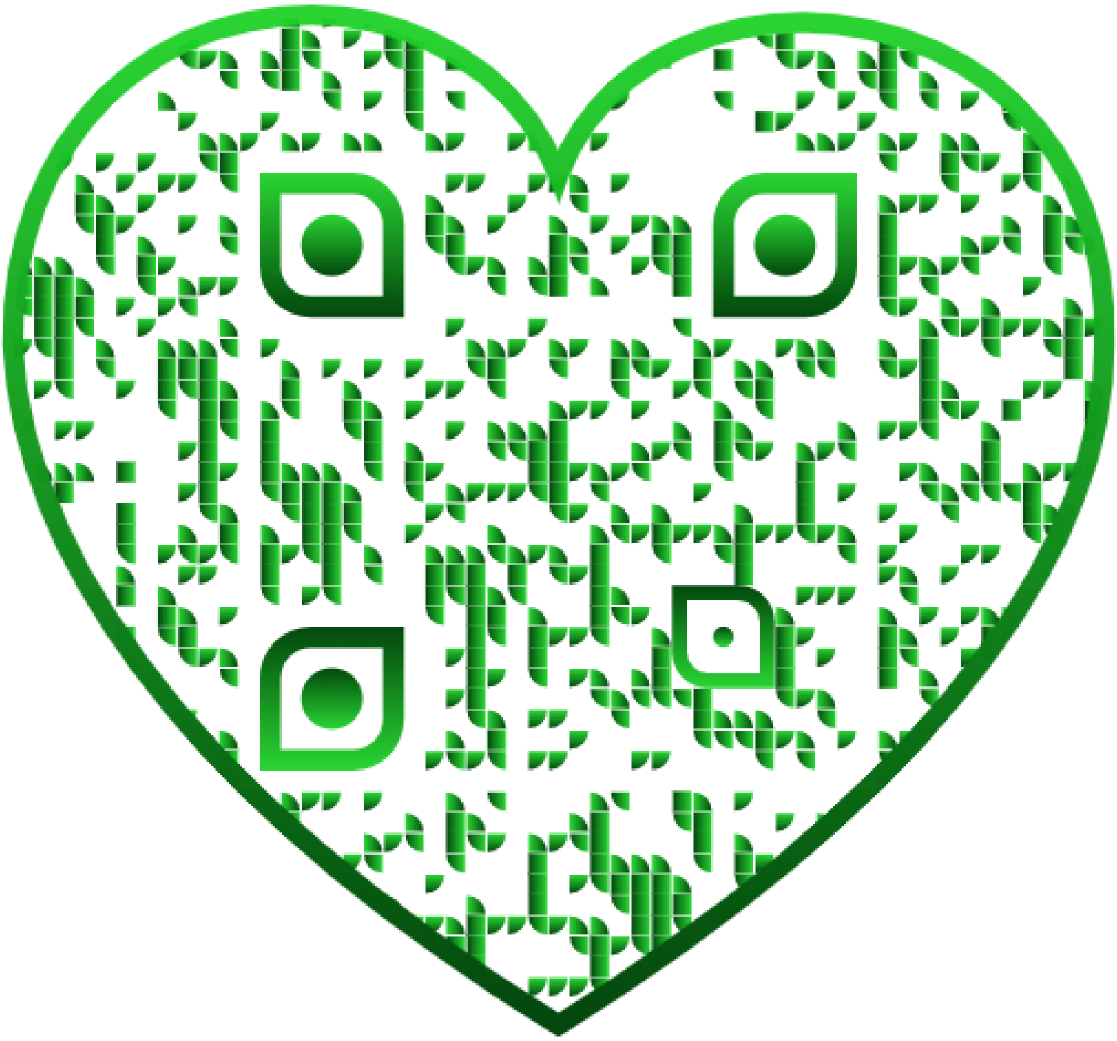
The trend sport
F3K yesterday and today

'Discus' 1:3.5

The all-rounder from TUN-Modellbau

models: F3F-model 'Saker' • 'Scirocco L' from Robbe • 'Piston Twin' from Höllein

report: More value with protective bags • MCM in France • GPS-Scene



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MR. MPX
HITEC

CONTENTS

Page 14
'Discus'
by TUN-Modellbau

Page 34
Visiting Aviation Toys

Page 44
'Cumul 100'
by Kavan

Page 90
'Piston Twin 150'
by Höllein

models

014 The 'Discus' from TUN with four-flap wing
040 All-round model 'Forza' from CRG – Part 2
044 The 'Cumul 100' from Kavan
050 F3F scene: The 'Saker' model and the British league
090 The 'Piston Twin 150' from Höllein – Part 2
094 The 'Scirocco L' from Robbe

report

026 Prowing 2025
032 Preserving value with protective bags
034 Visiting Aviation Toys in the Netherlands
056 F3K history – from 1989 to today
062 Visiting MCM in France
076 F3L scene: regulations and models
080 Young athletes: Louis Bendixen

Cover **pilot** *Philipp Gardemin* **model** *"Discus' 1:3.5 (TUN-Modellbau)* **location** *Neumalsch, Baden-Württemberg* **photo** *MDD-Pictures*
Preview **pilot** *Patrick Trauffer* **model** *"Dolphin XXL' (self-built)* **location** *Müswangen (Switzerland)* **photo** *Joe Mathis*

Page 62
MCM in France

pull over
protect your plane
-over-products.com
OE-0308

Page 32
Preserving value with protective bags

Page 50
F3F scene and the 'Saker'

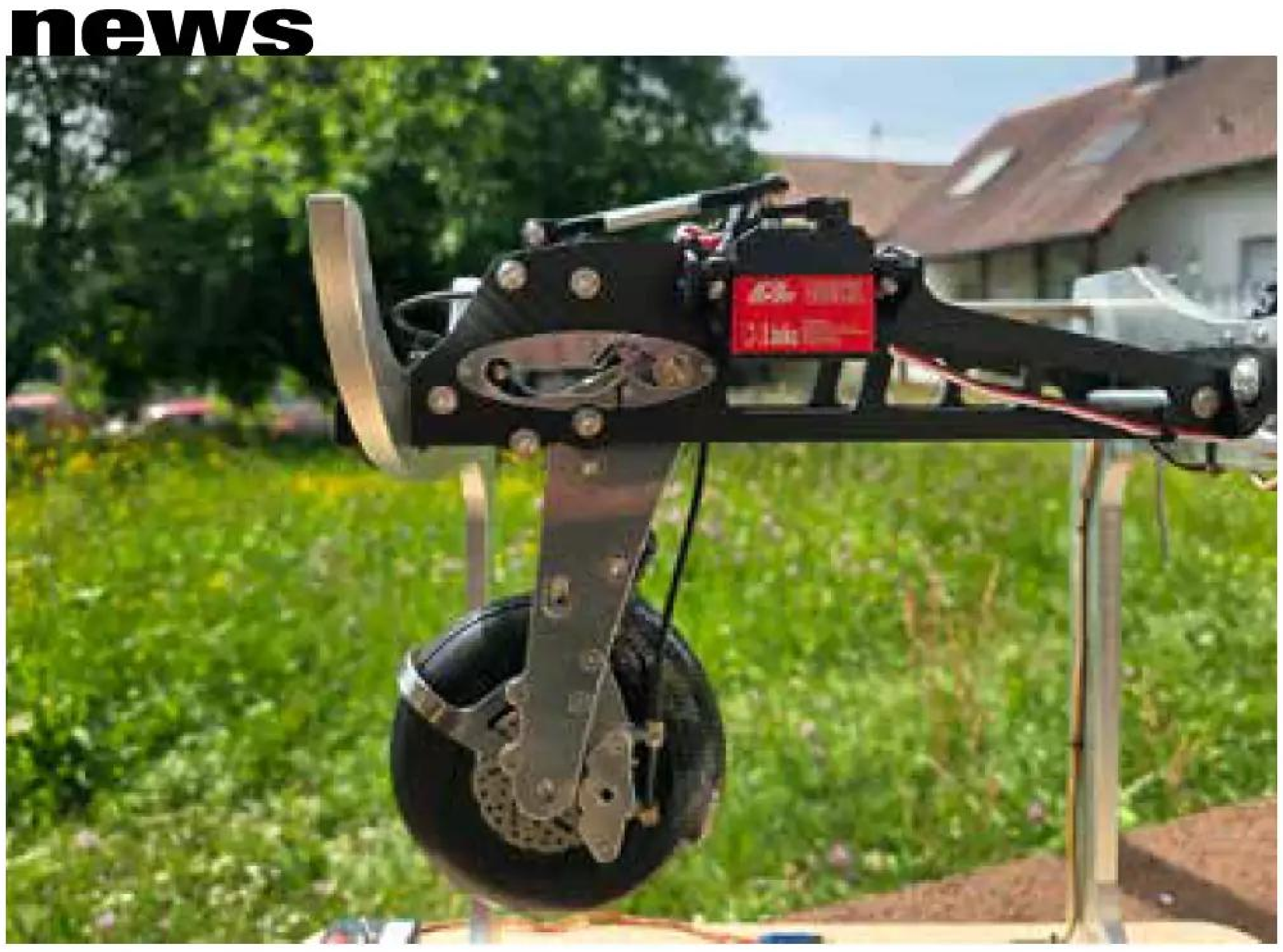
Page 26
That was Prowing

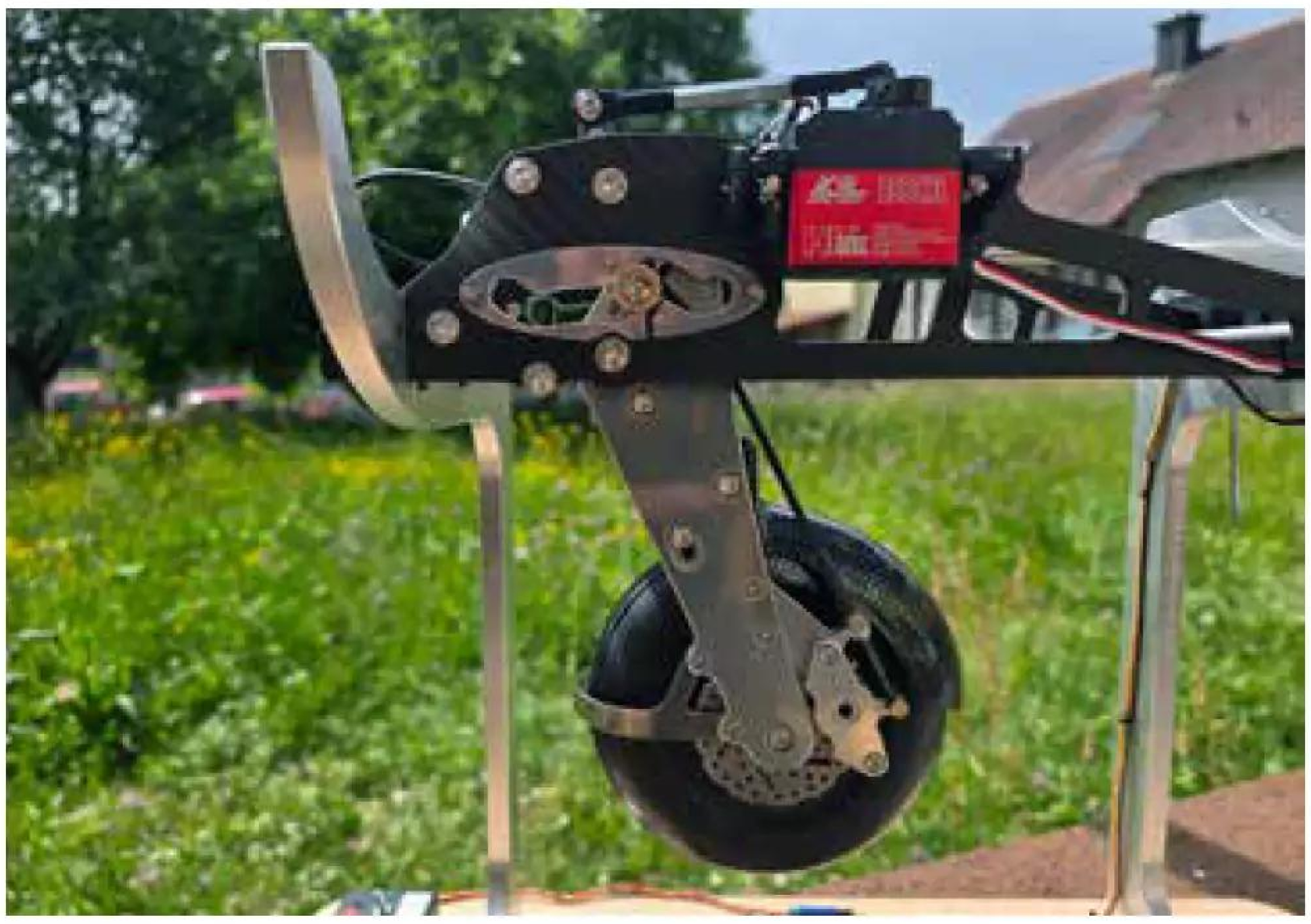
technology

065 Product special: the 'Dual Charger' from Hacker
068 Ballast strategies for model gliding
072 Product special: Model stands by Michael Gerst
082 Electric, but right: The electric tow

sections

004 Table of contents
006 News
010 Fairs & Events
020 Pictorials
038 GPS news
054 Gliding news
060 Promotion: Model flying & holidays
074 Promotion: Modeller specialists
098 Preview





New retractable landing gear

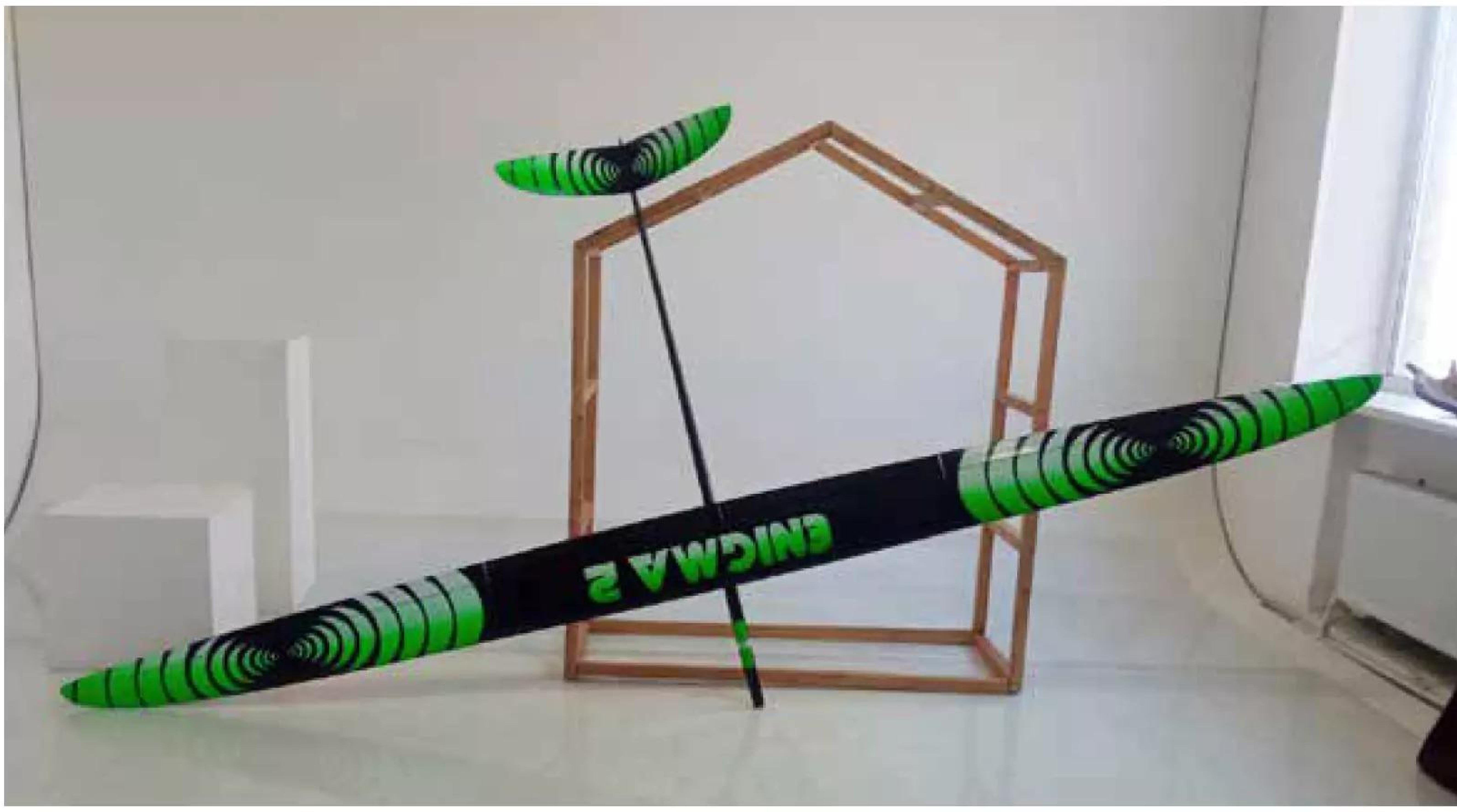
With the ‘Evolution-FES-Hybrid-EZFW’, Wemo is introducing a new innovative landing gear for the 1:3 scale with 112 mm wheels. It is designed for glider models with all drive variants and represents a technical advancement of the hybrid retractable landing gear that has been proven on the market for many years: Previously, the take-off position had to be set manually. To do this, the model had to be lifted by hand and the wheel pulled forward by hand. “Admittedly, this is sometimes tedious with heavy models, but it‘s not rocket science,” reports company boss Dietmar Werner. With the new ‘Evolution’, all three positions – ‘take-off’, ‘landing’ and ‘retraction’ – are now handled by a single servo: “You lift the model by the nose tip, switch to the take-off position using the three-way switch on the remote control, put the model down again – done,” continues Dietmar Werner. The new landing gear has a complex guide track that determines the position of each wheel. The guide track is integrated into the side sections. The entire landing load is absorbed by this track. If it becomes worn or deformed after very hard landings or years of operation, it can simply be replaced. In the ‘start’ position, the wheel axle is 49 millimetres further forward for this landing gear size and the model is eleven millimetres higher. This counteracts the model‘s pitching moment and increases the ground clearance of the propeller. The pictures clearly show the guide rack and the servo for the three positions. The standard equipment of the ‘Evo FES Hybrid’ landing gear includes two side panels made of 4 mm carbon, two-wheel arms made of high-strength 5 mm aluminium, a Fema wheel with ball bearings and 8 mm axle, four integrated carbon servo mounts for two standard servos and front mounting in the main frame using two torsion plates. The chassis is designed for installation between two frames, with optional rubber swing bearings at the rear. Torsion plates have been developed for attachment to the front of the frame. They weigh only eleven grams, instead of the approximately 100 grams of the aluminium blocks used previously. A standard size 120-degree HV servo is used for the extension and retraction process. Stainless steel wheel brackets, ABS wheel covers in carbon look, carbon wheel brakes with Bowden cable linkage or disc brakes, rubber vibration mounts, front and rear frame sets and limit switches for querying and displaying the landing position via the remote-control telemetry are available as accessories. The new landing gear will be presented to the public for the first time at the gliding exhibition in Schwabmünchen (German) in July.

Price: on request; available from Wemo-EZFW, phone: +49-6346/9893602, www.wemo-ezfw.de.

Classic models made of GRP

GRP fuselages for the Graupner classics ‘Cirrus Standard’ with a wingspan of three metres (fuselage length: 115 cm, weight: 222 grams, price: 139,- euros) and ‘Thermik Sport’ with a wingspan of 2.5 metres (fuselage length: 116 cm, weight: 268 grams, price: 119,- euros). They form the basis for a DIY project or simply replace the previous ABS fuselages.

Available from SG-Modellbau, phone: +49-151/58246698, www.sg-modellbau.de.



F5J model

The ‘Enigma 2 F5J CFK’ from Modellbau Pollack is a high-tech, full CFRP model with a wingspan of just under four metres. The wings and tail are constructed using a solid core design and the fuselage is in two parts. The tailplane, available as either a V-tail or a cruciform tail, is in two parts and is made of spread carbon. The tailplane servos are now mounted directly on the tailplane spar at the fuselage split. The fuselage contains a ballast compartment accessible through the canopy. It can hold 650 grams of ballast. The spinner diameter is 32 millimetres and the motor mount is fully assembled. The four-part, four-flap wing has a 1.5-degree V-shape in the centre section and a six-degree V-shape towards the outer wings. All holes, screw connections, locks, plugs and the wiring harness are complete. The model is available in two versions: while the ‘Standard’ and ‘Strong’ versions are both laminated with 62 g/sqm CFRP fabric, the ‘Strong’ version has a stronger main spar and additional CFRP reinforcement inserts. The flight weight is specified as approximately 1,500 grams. ‘This is not a delicate Light F5J model, but a robust, easy-to-fly, high-performance model for everyday use that will delight competition and leisure pilots alike,’ says Gerhard Pollack.

Price: from 1,599,- euros; available from Modellbau Pollack, phone: +49-981/14224, www.modellbau-pollack.de.

Receiver batteries

Hacker Motor presents the ‘Power-Ion’ battery packs in various capacities. Their advantages include high mechanical resistance thanks to their metal cell cups and long service life. Hacker also emphasises that no balancer is required for their operation and charging. In the event of a short circuit with a current higher than 150 amps, a short-circuit protection is also activated. Overcharge protection is activated when the charging voltage rises above five volts per cell. Each battery pack is equipped with a two-core cable with a JR plug and a two-wire cable with an MPX plug. Both cables are the same length (135 mm). The battery packs are available with 6,200 milliampere hours (2s2p, 230 g, 104 x 47 x 50 mm, 73.90 euros), 5,200 milliampere hours (2s2p, 230 g, 104 x 47 x 50 mm; 54.90 euros), 3,100 milliampere hours (2s1p, 136 g; 104 x 47 x 32 mm, 47.90 euros) and 2,600 milliampere hours (2s1p, 136 g, 104 x 47 x 32 mm, 35.90 euros).

Available from specialist retailers and Hacker Motor, phone: +49-871-953628-0, www.hacker-motor-shop.com.

JETI
RECEIVER BATTERY
Power Ion RB 5200
CE

New servos

Swiss companys Leomotion and Chocofly have now introduced the ‘Fox Ultra HV’ servo series. They have been specially developed for high-voltage operation with 4.8 to 8.4 volts. With torques of up to 25 kg*cm, they are suitable for demanding applications in aircraft and helicopters. The metal gears ensure robustness, while the compact dimensions allow flexible integration. The series includes models such as the ‘Ultra Fox HV 180/25Gear’, ‘Ultra Fox HV 20/25S’, ‘Ultra Fox HV 9/3.0S’ and ‘Ultra Fox HV 9/3.0SW’, which can be used to meet a wide range of requirements.

Available from Leomotion, tel.: +41-44/9500597, www.leomotion.com.

ULTRA
FOX
HV 20/25S
LEOMOTION
REACH NEW HEIGHTS

Cooperation

Composite RC Gliders (CRG) has taken over exclusive distribution of the model aircraft of the renowned Italian company Glider-IT for Germany and Austria. ‘This expands our portfolio with a range of innovative and high-performance gliders and electric model aircraft,’ emphasises Managing Director Werner Fehn. In addition, further synergistic collaborations between CRG and Glider-IT in the areas of development and production are in the pipeline with a view to jointly realising forward-looking projects for the model aircraft market.
www.composite-rc-gliders.com

COMPOSITE
RC GLIDERS
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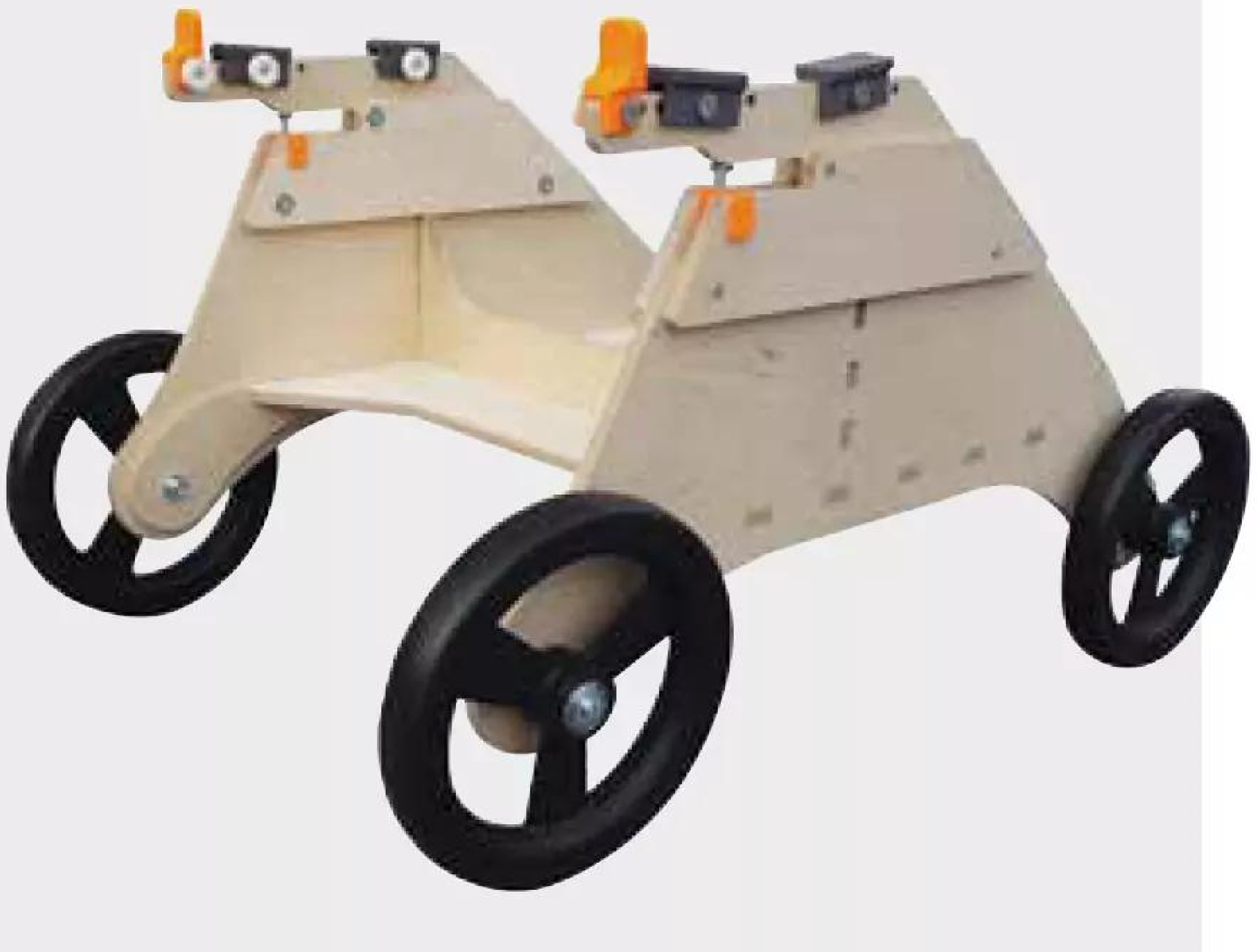
Wing connectors

The US manufacturer Wingbones offers a comprehensive range of wing connectors for many different aircraft types, with a focus on the F3J and F5J competition segment. Company boss Randy West, himself an active F5J competition pilot, highlights the low weight and durability as outstanding features. The weight of the connectors corresponds to the originals from the respective model manufacturer. They are also sold in pairs. They are labelled with angle specifications and model names on the front and end faces. Randy West emphasises that all connectors have been extensively tested with the respective models. The connectors are manufactured at the company‘s headquarters in Chandler, Arizona (USA) from a high-quality carbon fibre composite polymer.
www.wingbones.com

Volo
WINGBONES

Launch trolley

Florian Schambeck Luftsporttechnik is now introducing a newly developed launch trolley for the safe and precise launch of electric glider models. “It is the first launch trolley that allows you to take off in a controlled manner,” reports Florian Schambeck, explaining: “Many previous launch trolleys cause instability problems during take-off. We have a solution: the faster the glider accelerates during the roll phase, the harder it is pressed onto the Startfix launch trolley. This prevents the glider from slipping and ensures that the combination rolls more stably down the runway. Once the take-off speed has been reached, the glider can be lifted off precisely by pulling on the elevator.” The launch trolley is available as a kit in various configurations.
Price: from 159,- euros; available from Florian Schambeck Luftsporttechnik, phone: +49-8803/4899064, www.schambeck-luftsporttechnik.de.



All-round glider

Composite RC Gliders presented the new ‘DG-808S’ at Prowing. The model has a wingspan of 3.55 metres and weighs approx. 2.7 kilograms when empty. CRG emphasises that it is an all-round thermal glider with great potential for fun. The flight weight is specified as around 3.4 kilograms. The scope of delivery includes a GRP fuselage, GRP tail units and GRP winglets. The four-part, six-flap wing is manufactured in an abachi sandwich construction, is continuous and partially reinforced with glass fabric and has a spar. The ‘DG-808S’ is equipped with an ‘HQ 1.5/12 mod.’ airfoil. The pack size is stated as 1.3 metres. *Price: 899,- euros; available from Composite RC Gliders, phone: +49-2405/6458150, www.composite-rc-gliders.com.*

On our own behalf

Subscribers to the AUFWIND magazine will be familiar with the names Interabo and Primaneo. For around 30 years, subscriptions have been managed and invoiced here. As of 1 May, the team at Zenit Pressevertrieb (photo) in Stuttgart has taken over these tasks. Nothing will change for subscribers; only the name on the annual subscription invoice will be different, and calls (phone: +49-711/82651-340) and emails (aufwind@zenit-presse.de) will be directed to Stuttgart instead of Hamburg. The previous telephone numbers and addresses have been redirected. Subscriptions to the English edition of AUFWIND will now also be managed by Zenit. “I would like to thank Interabo and Primaneo for their long and trusting cooperation and look forward to working with Zenit,” emphasises publisher Philipp Gardemin. *www.aufwind-shop.de*

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FAIRS & EVENTS

THE CURRENT MODEL SPORTS SEASON IS IN FULL SWING

The gliding fair in Schwabmünchen (Germany) in July is the highlight of the big glider scene again this summer. At the end of June, it‘s off to the Flying Circus in Fiss (Austria) at an altitude of 2,500 metres, and fans of vintage glider models will meet on the Wächtersberg (Germany) in July. And there‘s much more going on this summer.

GLIDING EXHIBITION

From 18 to 20 July, the international glider fair will once again take place at the Schwabmünchen Air Sports Club airfield (Germany). Since 2012, the small town of Schwabmünchen, about 30 km south of Augsburg, has been home to what is probably the most important event in the large glider scene. By mid-May, almost 50 exhibitors had already registered, which is in line with last year‘s registration figures. Newcomers include Ceflix, Swiss Model Shop from Switzerland, Tobcon, Aerobertics from Belgium and KB3aero from Italy. Organiser Lukas Nakir expects a total of around 50 exhibitors. Together with Robin Faigle, Lukas Nakir has refined the concept based on discussions with exhibitors and visitors. As usual, Friday will be dedicated exclusively to gliding. In the evening, there will be free flying for all registered pilots to round off the day in a relaxed atmosphere. Gliding will also take centre stage again on Saturday. In the evening, there will be a moderated air show. Finally, Sunday will be dedicated to ‘young talent, families and showcasing what is probably the most beautiful hobby in the world.’ In addition to the presentation of gliding models by the exhibitors, there will also be show models and highlights from the entire model flying scene. Highlights of the air show include the Flippers team with 3D jets and aerobatic models, Martin Sannwald with an ‘XXXL Starfighter’, Allessandro Panzanini with ‘Habicht’ and ‘Bücker’ (both models on a scale of 1:2) and the Swiss gliding aerobatics team Schaerer with their ‘Swift S1’. With a large poster campaign in the region, Lukas Nakir also wants to reach the general public on the Sunday of the event in order to give model flying a new boost. Numerous exhibitors have already announced that they will adapt their presentations and product ranges to the new visitor structure on Sunday.

The exhibition days will once again be moderated by Ralf Doll and Martin Hübsch. The evening show will be moderated by Alex Stobinski (3D-Bros), Matthias Encke and Lukas Nakir. Flight control will once again be in the capable hands of Don Attilio Vagnoli. Claus-Jürgen Grobe will be responsible for coordination.
www.segelflugmesse.de

RCFA GLIDER MEETING

For the fourth time, RC Flight Academy is hosting a glider meeting on 19 and 20 July at the Hurlach Model Flying Club (www.mfc-hurlach.de). Just a few kilometres away from the glider fair Schwabmünchen taking place at the same time, it is well worth visiting both events. 'An exciting and varied programme centred around our models awaits you,' says RCFA owner Erwin Schreiber, describing his in-house exhibition. He and his team pilots will be on hand to answer questions and chat. Numerous owners of RCFA models from Germany and abroad are also invited. Teacher-student flying will also be offered. The focus will be on the 'ASG-32', which was recently added to the Tomahawk range, and the in-house models 'AS-35' and 'L-231A'. Towing will again be carried out primarily with the 'Symphony' in two wingspans, 3.4 and 3.9 metres. The club will provide catering to ensure that everyone is well fed and watered. Erwin Schreiber particularly highlights the beer garden atmosphere with a large shaded area and looks forward to welcoming his guests. A get-together is planned for Saturday evening. Please register by emailing info@rc-flight-academy.de or sending a WhatsApp message to +49-1520/9893898.

www.rc-flight-academy.de

PACE MEETING AT TANNENALM

Year after year, model aircraft enthusiasts flock to Tannenalm in the Austrian Zillertal valley. They come for the excellent thermals, good food and friendly conversation among like-minded people. Helmut, the hotel manager and also a model aircraft enthusiast, looks forward to welcoming his guests. The hotel offers well-equipped rooms of various sizes with power connections and shelves for all your model aircraft needs. Almost everything flies here, from beautiful wooden models to high-performance CFRP models and from HLG to 6-metre large gliders. Some enjoy tranquil thermal flying, others the ultimate in slope flying. Another eye-catcher is the boss, Helmut, when he flies his six-metre-wide 'Pace' from Lesky Composites. Many 'Pace' enthusiasts meet up every year at the Tannenalm with the manufacturer Daniel Lesky to fly and exchange ideas. The meeting has been taking place since 2017. Host Daniel Lesky invites customers and friends from Germany, Austria and Switzerland to fly together with 'Pace' models from the last 17 years: from the first 'Pace DS' from 2007 to the current 'Pace FX2' with a wingspan of six metres. Next date: 27-31 July.

Wolfgang Haecker

29TH FLYING CIRCUS IN FISS

From 26 to 29 June, the high-altitude international gliding event Flying Circus will once again take place in the Serfaus-Fiss-Ladies region (Tyrol). 'Flying Circus is known for its informal and relaxed interaction with manufacturers and their team pilots,' reports organiser Gerd Holzner. Numerous manufacturers will be there with their teams. Among them is Chocofly: Daniel Aeberli and his team will be flying their new 'ASW-20' (4 m, 6.4 kg) and the 'AN-66D' (4.66 m, T-tail), among others. Composite RC Gliders have announced the dynamic all-rounder flying wing 'Trinity' (3 m, 2.1 kg) with six-flap wings. They also want to fly the 'Hawk' with a wingspan of one metre as a PSS model. Another new addition will be the DG-808S (3.75 m) with an Abachi sandwich wing. Martin Pramstrahler, Elia Salcher and Dominik Lintner will be at the start for PS models. They will mainly be bringing the new Kobuz 2.2 and Swift 2.2. The new models were developed in collaboration with Chocofly (Daniel Aeberli) and Migflight (Georg Schamberger). All model glider pilots are invited to the big gliding event under the motto 'Flying among friends' – whether you fly foam, wood or composite models, with or without a prototype. The traditional joint pilots' dinner at the Hexenalm will take place on Friday evening, and Saturday will be rounded off with sunset flying at the Perdatscher Bichl model airfield (with Leberkäse and drinks). To register on site, you will need an eID number, proof of insurance and proof of competence (A1/A3). Models weighing up to 25 kilograms are permitted, and a white flashing anti-collision light (ACL) is required for models weighing ten kilograms or more.
On Friday, 27 June, Rookie Day will be offered again, ideal for beginners in high-altitude gliding. Further information about the event, the current programme, the flight regulations and pre-registration can be found on the website www.flying-circus.de.

Thorsten Häs

GLIDER CLASSICS WÄCHTERSBERG

From 4 to 6 July, the 22nd Glider Classics vintage aircraft meeting will take place at Wächtersberg (72218 Wildberg, Germany, Wächtersberg model airfield) in the northern Black Forest. Models of original gliders built before 1985 are eligible to participate. "Flying will begin on Friday at 2 p.m. Camping facilities are available at the airfield," reports Falk Waidelich, who has been organising this prestigious event with international participation for many years together with his team.

www.mfg-waechtersberg.de

WORLD RC SOARING FESTIVAL

From 27 to 29 June, the three-day hang gliding event will take place at the Sky Park site above San Bernardino near Los Angeles. Sky Park owner Bill Johnson and US entrepreneur Karlton 'Mr. MPX' Spindle are delighted with the high level of interest from international exhibitors. One of the latest additions is Mibo-Modeli from Slovenia. Robbe-Modellsport has produced a special limited edition hang glider model especially for the event and presented it at Prowing (photo). "Join us for three days of alpine model flying in the breathtaking surroundings of Lake Arrowhead in California at an altitude of around 1,800 metres," emphasises Karlton Spindle once again. He has limited the number of participants to 100 in order to offer all pilots maximum flying fun. AUFWIND is the media partner of the World RC Soaring Festival. Editor-in-chief Philipp Gardemin will be there to report extensively. "Sky Park offers more than just model flying. Bring your family and enjoy an unforgettable experience in sunny California," says Karlton Spindle.

www.mrmpxhobbies.com

AUFWIND
SKYPARK

COMPO-CON

The Compo-Con DIY aircraft event will take place again on 6 September 2025. It will be hosted by the Lemgo Model Flying Club (www.mfc-lemgo.de) in Lower Saxony (Germany). "Compo-Con is the community meeting for everyone who is enthusiastic about modern model aircraft made of composite materials, whether gliders, jets, motorised aircraft or helicopters," says organiser Mark Will. The event focuses on technical exchange, technology, fun, flying and tips and tricks for laminating, painting, construction methods, materials and model making. The detailed programme and all registration information can be found on the website.

www.compocon.eu

Fairs & Events at a glance

26-29 June
Flying Circus, Fiss
Austria
www.flying-circus.de

27-29 June
World RC Soaring Festival,
Sky Park
California, USA
www.mrmpxhobbies.com

4-7 July
Segler-Classics, Wächtersberg
Germany
www.mfg-waechtersberg.de

18–20 July
Gliding Fair, Schwabmünchen
Germany
www.segelflugmesse.de

14–17 August
German-French Model Flying
Festival, Wasserkuppe
Germany
www.dmfv.aero/modellflug-festival-2025

5–7 September
Glider Expo, Hülben
Germany
www.freundschaftsfliegen.de

31 October–2 November
Fascination of Model Building,
Friedrichshafen
Germany
www.faszination-modellbau.de

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UPDATE

THE ‘DISCUS’ FROM TUN-MODELLBAU

The ‘Discus’ has proven to be an all-round talent with a wide range of capabilities.

A little over two years ago, Philipp Gardemin described the construction of the 1:3.5 scale 'Discus' in detail in AUFWIND. The model proved its all-round capabilities during many hours of flying in the 2023 season. It was then offered with a four-flap wing. Here is an update.

I flew the 'Discus' with its 4.3-metre wingspan a lot and with great pleasure throughout the summer. Weighing 7.8 kilograms, the model was just the right size for everyday use and as an all-round model. On balmy summer evenings, I flew it in low flights around the airfield, sometimes with and sometimes without motor assistance.

Extended thermal flights were much more relaxed than before thanks to the powerful Unilight flashers on the underside of the wing. More than once I told myself that I would never again build a glider without flashers. This is because, especially when flying with GPS, you often have to switch your gaze from the model to the screen and back again. It is therefore essential to be able to recognise the model immediately. I mounted the five-centimetre-long, four-gram 5-bar lights directly next to the servo shafts of the aileron servos. They each provide approximately 3,500 lumens. With the 1-channel control from Unilight, various flashing modes and continuous light can be selected. The entire unit is powered by an extra 3s LiPo battery with 800 milliampere hours. The crowning glory of the season came in October with countless flights in the typical olive tree thermals at the Model Flying Ranch in Spain. The FES landing gear, the hidden lock and the hinge for opening the cockpit canopy, which was designed by Wemo to be true to the original, also proved themselves suitable for everyday use.

However, there were two things about the model that I didn't like despite everything: Firstly, there were the landings of the 'Discus'. The model could hardly be slowed down enough with the spoilers alone. The model responded to a slightly increased angle of attack by slipping away over one of the two wing tips. Secondly, I wanted to improve the already good flight performance by flattening or cambering the wing.

In Prague, I met the manufacturer of the model for a private dinner. He gratefully accepted my request for a wing with four flaps, and just two months later I received a new pair of wings. The new pair weighed only 80 grams more than the two-flap wing. So, without further ado, I removed the servos and Unilight lighting from the old pair of wings and fitted them to the new pair. The additional flaps were also equipped with the tried-and-tested 'GM992HV' servos from Grupp Modellbau, as were the ailerons and spoilers. I had to add an extra cable to the existing wiring harness. The former six-pin connector for connection to the fuselage was replaced by an eight-pin connector. The wiring in the fuselage was also extended accordingly. And the receiver was now replaced by a 14-channel receiver. The model's motorisation with the Kontronik 'Kondor XL 30-44' (440 kv; 50 x 62 mm; 392 g) and a 16 x 10 inch folding propeller remained unchanged, as did the 6s LiPo with 4,500 milliampere hours.

During the conversion to the new wing, the fuselage nose was also given a new design.

The new wing with four flaps has significantly expanded the range of applications.

There is also space for a little self-promotion.

I initially programmed the inner wing flaps to five millimetres positive in the 'Thermal' flight phase, 45 degrees positive in the 'Landing' flight phase and two millimetres negative in the 'Speed' flight phase. These were basic values that I wanted to refine later. In the 'Landing' flight phase, the spoilers are also extended at the same time.

For the maiden flight of the newly built 'Discus', I met Walter Grupp, Ingo Kalke and Simon Nelson at the Grupp Modellbau model airfield. Simon had his large Tomahawk 'Wilga' with him and towed the 'Discus' into the air for the first time. I recognised my 'Discus' right away during the first tow. Stable and responsive on all controls, I was able to follow the tow plane. At an altitude of 250 metres, I released the tow. Without any changes to the trims that had been flown earlier, the 'Discus' flew just as beautifully as before. We flew large circles around the airfield. When we reached the remaining 100 metres of altitude, I switched the drive back on for the first time and we climbed again at around eight metres per second.

But now it was time to try out the new flap settings. In the 'thermal' flight phase, it was immediately apparent that the model was slowing down. Using the variometer readings, we were able to determine that the sink rate was not increasing. The 'Discus' was now much smoother and more balanced in circles than before with just the ailerons. Simon Nelson suggested that I should also camber the ailerons positively by one to two millimetres in later flights. We did not observe any change in load, and neither high nor low brother mixing was necessary.

The landing phase was very similar: the 'Discus' slowed down sharply and went into a stable stall. There were no longer any signs of stall on the outer wing. By carefully adjusting the deflections, I was able to reduce the sink rate shortly before touchdown and let the model touch down cleanly on the wheel. Yes, that was exactly what I had been missing with the two-flap wing.

For the next flight, I programmed the ailerons with just under two millimetres of positive deflection in the 'Thermal' flight phase. Once again, we climbed in tow. Immediately after release, I switched to the 'Thermal' flight phase. Once again, we were able to observe how pleasantly the 'Discus' now circled. We had the impression that it could be flown even slower. The second landing of the day also confirmed the previously found 'Landing' flight phase.

The next take-off was now to be carried out again with the FES drive. I switched to the 'landing'

The first GPS triangles in the 'AUFWIND Scale 1:3.5' class were great fun.

The model was adjusted and tested in numerous flights at the Model Flying Ranch in Spain.

flight phase and was pleased to find that the model took off from the field much more easily and earlier than I remembered from previous flights. The climb was also significantly steeper and much smoother than with all flaps in the strak. I now wanted to test the 'speed' flight phase. By raising the inner flaps by about two millimetres, the 'Discus' became noticeably faster and more manoeuvrable. I would find out later exactly what I needed the 'speed' setting for.

Highly satisfied with the first flights with the four-flap wing, I drove to the Model Flying Ranch in Spain for a week. Several flights on the first two days confirmed my observations and experiences. I didn't change the flap settings. I was sure that the time was right for a few GPS triangles in the 'AUFWIND Scale 1:3.5' class. So I equipped the model with the 'Raven 2' GPS module from RC-Electronics and connected it to Florian Schambeck's TEK nozzle. With the 'Albatross' app on my smartphone and the connected receiver module, the system was up and running without any problems.

I then spent several flights getting to grips with GPS flying. I flew two tentative triangles on my first flight, feeling very nervous. But I was able to improve. Three triangles followed, then five. On another flight, I was on six triangles with 15 minutes to go when disaster struck: I had programmed the start of the flight task on a push button on the transmitter. Unfortunately, this switch was right next to the button for checking the altitude. So, in the middle of thermal flying, I pressed the wrong switch and the Albatros app restarted the task. The triangles I had flown up to that point were deleted. From then on, I set the start of the task to a different switch, much further away from the altitude check button.

By the end of the holiday week, I had added up my total number of triangles to 17. Of course, it could have been significantly more, but my enthusiasm had been awakened. And most import-

The original

The 'Discus' was developed by Schempp-Hirth in 1984 as the successor to the successful 'Standard-Cirrus' standard class glider. Thanks to its good-natured flight characteristics, the aircraft quickly found friends in club operations. It was even used as the first plastic single-seater in training.

Photo: Alec Wilson, CC BY-SA 2.0

After the introduction of its successor, the 'Discus 2', the Discus continued to be manufactured as the 'Discus CS' in Choceň (Czech Republic). And the 'Discus 2b' is used by the American Air Force Academy in gliding competitions under the designation 'TG-15B'.

Photographer Marco Durin Duchac (www.mdd-pictures.de) is new to the AUFWIND team. The 'Discus' series of pictures was the first joint project and certainly not the last.

antly, the flashers under the wing allowed me to always see the model and its flight attitude clearly, even at low altitudes at turning point 2. I considered optimising the flight attitude detection with a third flasher on the leading edge of the tail fin. I was able to practise handling the flight phases in the triangle. The 'Thermik' flight phase for turning and the 'Speed' flight phase for flying the route. The latter is especially useful if you want to reach the turning point quickly against the wind without the influence of thermals. And one more thing was confirmed: the 'Discus' is certainly not a model for achieving record numbers of triangles flown. However, it is ideal as an entry-level and training model for the fascinating world of GPS flying.

And if you don't have any GPS ambitions, the 'Discus' with its new four-flap wing is a versatile all-rounder with excellent flight performance and high robustness. ■

Philipp Gardemin

Photos: Marco Durin Duchac, Olaf Ketelsen

FACTS

'Discus' by TUN-Modellbau

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Output Torque: - 72 kg · cm (1000 oz · in)	Output Torque: - 18 kg · cm (249 oz · in)	Output Torque: - 20 kg · cm (277 oz · in)	Output Torque: - 51 kg · cm (708 oz · in)	Output Torque: - 35 kg · cm (486 oz · in)	Output Torque: - 63 kg · cm (874 oz · in)
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We have been hiking on Monte Lema several times. The 1,621-metre-high mountain is located in the Tambo group on the border between Lombardy and the canton of Ticino above the villages of Miglieglia and Astano. This time, we decided to take the tried-and-tested 'Funray' with us. We took the cable car from Miglieglia and a few minutes later we were already standing on the slope. What followed was a fantastic flying experience with a magnificent panorama.

Location: **Monte Lema, Switzerland**
Pilot: **Uwe Grenda**
Model: **'Funray', Multiplex**
Photo: **Tamara Grenda**

TEAM
XTREME

EXPERIMENTAL
39

We were guests at the LSF Scale Glider Rally in Jerilderie in south-western New South Wales (Australia). Events related to model gliding have been held here since 1978. The large towing event with scale models has been held since 2005. This year marked the 20th anniversary of the event, with 45 pilots from all over Australia taking part. Ueli Nyffenegger from TUN-Modellbau in Switzerland also participated. The ‘Bidule 170’ flew for over nine hours over two days, bringing all participants up to altitude several times.

Location: **Jerilderie, New South Wales, Australia**
Pilots: **Participants in the LSF Scale Glider Rally**
Models: **From vintage gliders to large sailplanes**
Photo: **Michael O‘Reilly, Modelflight.com.au**

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MODELLERS FESTIVAL

ALMOST 11,000 VISITORS CAME TO PROWING

„Prowing is not a classic model fair, but a fun festival for model flying," emphasised AUFWIND owner Philipp Gardemin in a statement. And he's right: 10,800 visitors can't be wrong, and from 2 to 4 May they enjoyed three days of model flying at its finest. They came from all over Germany, as well as France, Switzerland, Benelux and Scandinavia. Herbert Locklair and Philipp Gardemin captured their impressions. Next year, Prowing will take place from 24 to 26 April. ■

Editorial

OAKLEY
CHASERVO
CHAMPIONSHIP PERFORMANCE

Where there's CHA Servo, there's Patrick Speidel. His expression and gesture say it all: „Prowing was a success."

IN BAD SASSENDORF

The exhibition grounds were well attended indoors and outdoors on all three days. Here at the Unilight stand from Austria.

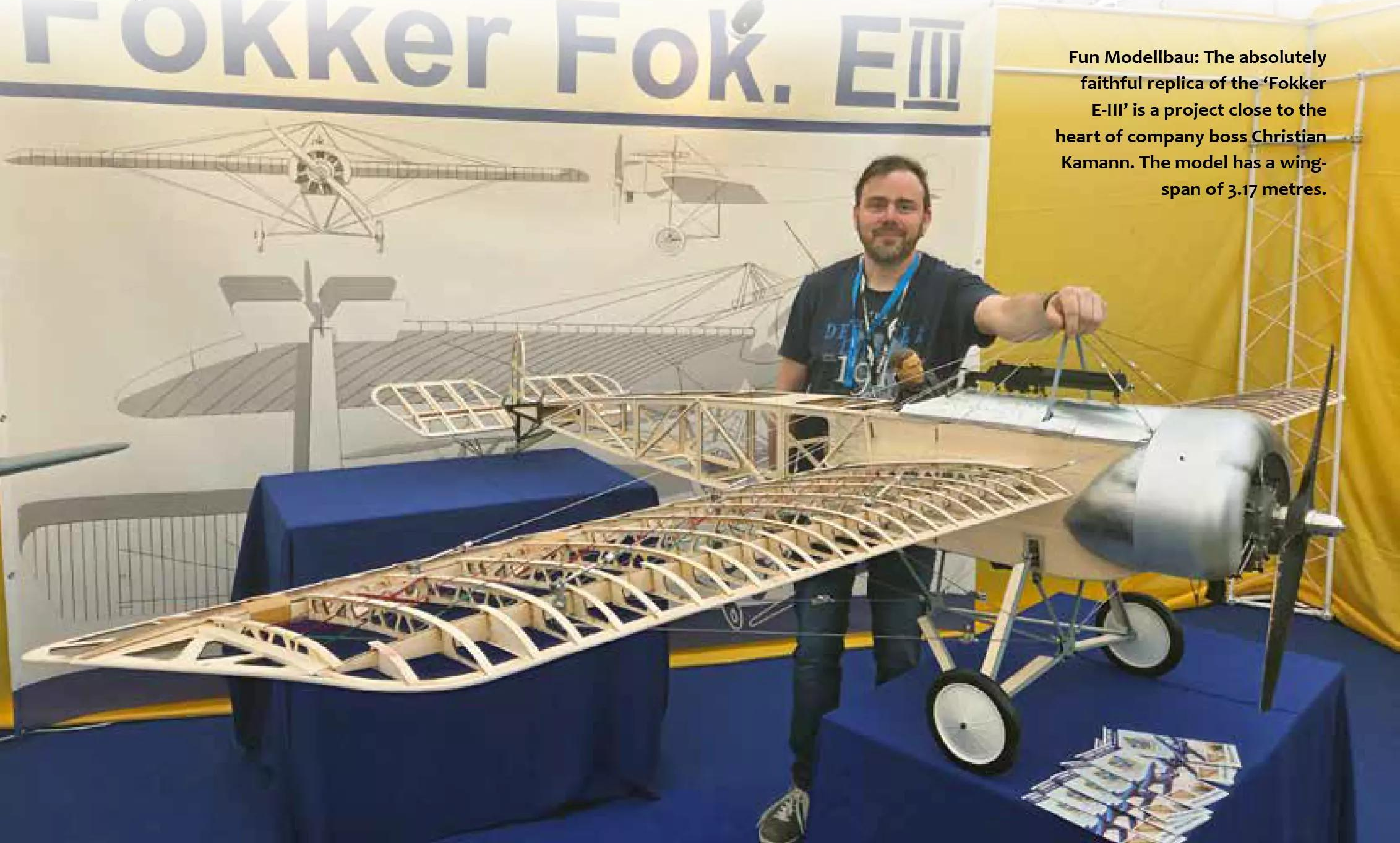
17 M
D-KCHA
DG
5
29
D-KPES
DMFV

Aeronaut: The mood was also good for designer Michael Bloß and company boss Thorsten Rechthaler. Their wooden kits from their own production were once again well received this year.

Composite RC Gliders: The team of active pilots had a lot of fun at Prowing. Above their heads was the new 'DG-808S' with a wingspan of 3.55 metres and an Abachi sandwich wing with six flaps.

Engel Modelltechnik: With a large selection of accessories for motorised and gliding flight, this was the place to be for all large model fans. Company boss Andreas Engel is one of the three initiators and organisers of Prowing.

CHA-Servo: Once again, the CHA team was able to give visitors to the trade fair a closer look at its servos and models. The servos were also demonstrated in action in the air show with various models.



Fun Modellbau: The absolutely faithful replica of the 'Fokker E-III' is a project close to the heart of company boss Christian Kamann. The model has a wingspan of 3.17 metres.

Flight-Composites: Ralf Steinbach designed the new ‘Celest’ specifically for the GPS sport class. The model has a wingspan of 4.65 metres and was designed in collaboration with Dirk Pflug.

Airfly: Robert Richter has revived Manfred Nöker‘s old model aircraft brand. He and his team specialise in retro models of their own design and manufacture.

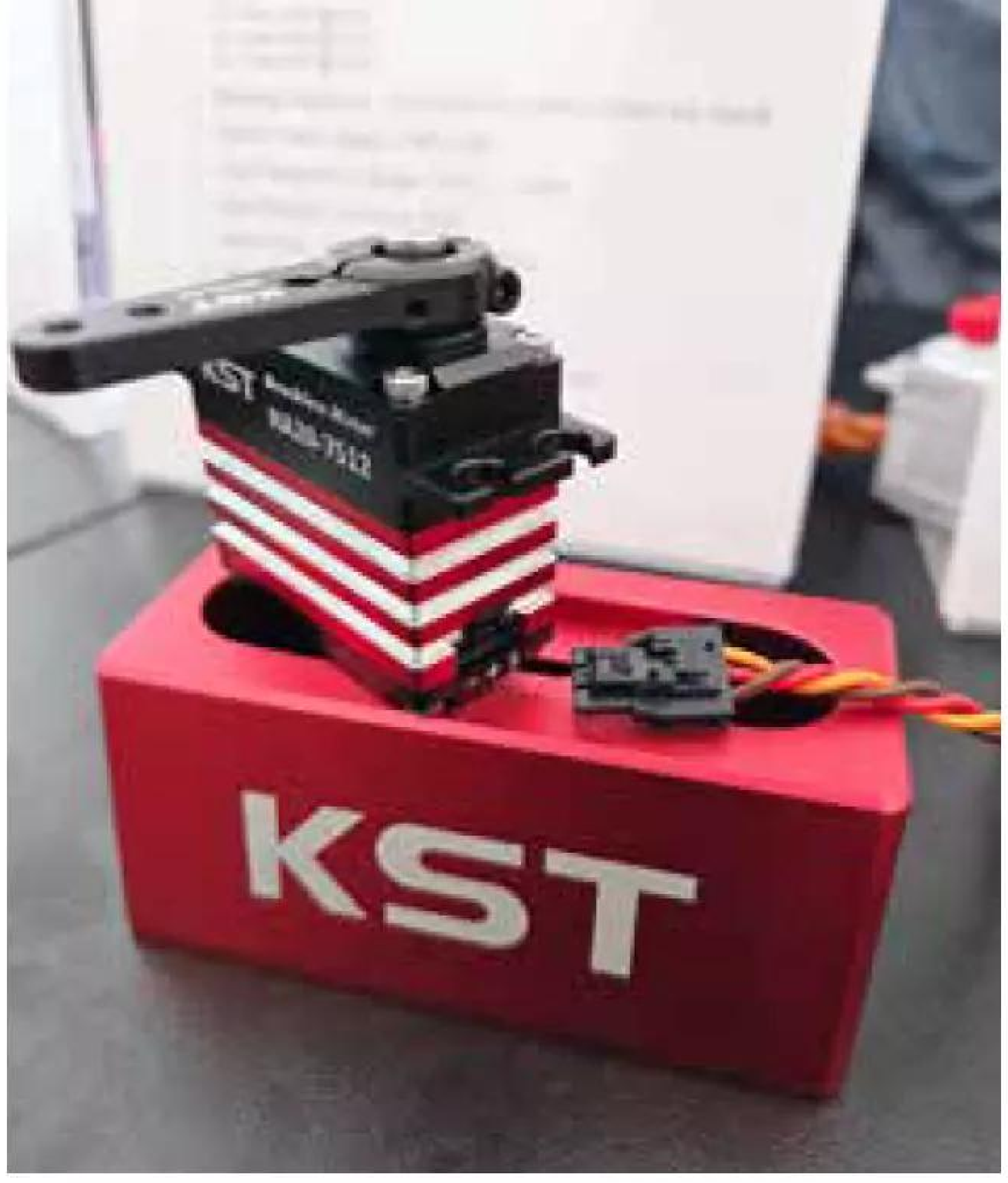
Hacker Motor: The motor and Jeti RC experts were constantly in contact with customers. The range of high-quality accessories, such as magnetic locking systems, is currently being expanded significantly.

Höllein: The new ‘Zefixx’ was completed just in time for Prowing. Ryan Höllein was instrumental in the development of the two-metre-long hotliner with four-flap wings in a wooden construction.

Aviation Toys: Vincent Merlijn (left) was there for the first time with a team of talented modeller colleagues. His range of self-produced wooden kits has attracted many new friends.

Tobcon: Ulrich Tobuschat (right) was at Prowing for the first time. He gave an impressive demonstration of his innovative engines.

Para Aviation: Rico Priesnitz is an enthusiastic paraglider. The „Libra 3.7 RS“ has a wingspan of 5.25 metres and a new airfoil.



KST: The „HA20-7512“ (20 x 20 x 40 mm) is powerful. It delivers around 82 kilos at 8.4 volts and weighs 70 grams.

Powerbox Systems: RC technology for demanding modellers is the focus of Eva-Maria and Richard Deutsch. Visitors to the trade fair made good use of the advice service.

SG-Modellbau: Stefan Graupner is bringing classics back to life. The new ‘Amigo XL’ is available as a CNC wood kit, has an impressive wingspan of 2.8 metres and a four-flap wing.

Robbe Modellsport: Team pilot Klaus Gottsmann and product developer Stephan Plewinsky are driving forward the development of electric glider models. The new ‘Argos’ (full CFRP) has a wingspan of 2.75 metres.

Gernot Bruckmann thrilled trade fair visitors with impressive aerobatic displays.

The air show and manufacturer flights featured top-class performers and were very varied.

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SUSTAINABILITY IS A JOY

PULL OVER KNOWS HOW TO KEEP MODELS LOOKING GOOD

Shiny surfaces without scratches or dents play a key role in maintaining the value of model aircraft. This is exactly what Pull Over in Germany supports. Philipp Gardemin spoke to company director Günter Simen.

Protective bags and carrying cases for model aircraft are very much in vogue. The range on offer is as diverse as the materials used to make them. The selection ranges from simple bubble wrap from the hardware store, coated with fabric or aluminium foil, to fabric combinations and high-quality quilted materials. Many new suppliers have entered the market in recent years. Some operate production in their spare time, while others have developed it into a business model.

Pull Over in Kirchheim/Teck (Germany) is considered a pioneer in this field and one of the oldest suppliers in this market. For almost 25 years, Günter Simen has been manufacturing protective bags for model making on his own. Many customers come by in person with their models and take advantage of the immediate service. In addition to a standard selection of models, the vast majority of bags are custom-made – genuine craftsmanship.

“Sustainability and value retention are playing an increasingly important role in model making and can also be fun,” emphasises Günter Simen. He knows from experience that his protective bags are not only used for high-priced full GRP models. The number of customers with wooden models is steadily increasing. “Even models in the lower price segment are sometimes wrongly labelled as disposable models. They still look good even after years of use, provided they are properly protected,” says Günter Simen. The fact that this means fewer models end up in the rubbish bin supports the trend towards sustainability.

Pull Over also practises sustainability when sourcing raw materials: most of the materials used, apart from the shipping cartons, come from the home region around Stuttgart. Only the quilted fabric for the torso pockets comes from North Rhine-Westphalia in Germany. “Fuselage bags are really catching on,” reports the entrepreneur. The quilted fabric used for this, like the company‘s own bubble wrap, is specially manufactured to his specifications. “The material can be adapted perfectly to three-dimensional fuselage shapes, is water-repellent, has a middle layer of filling wadding weighing 400 grams per square metre and the inner layer is made of the same material as the outer layer,” spills the beans Günter Simen.

Protecting glider models is the focus of Pull Over‘s daily work.

Sustainability is also practised when cutting the fuselage bags: the parts for protecting the vertical tail, for example, are sewn onto the fuselage tube afterwards, as this would otherwise generate too much waste. Finally, the fuselage bags are fitted with a long zip, which is covered with fabric on the inside to prevent scratches on the fuselage.

Wing and tail pockets are mainly made from Pull Over‘s well-known blue bubble wrap, which is largely produced from recycled granulate. In a special manufacturing process, a fleece is laminated onto one side and the aluminium-blue cover material even consists of five different layers.

The majority of Pull Over‘s customers come from Germany, Switzerland, Austria and other neighbouring European countries. The greatest demand at Pull Over comes from the field of model gliders and motorised model aircraft. However, owners of high-quality

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Fuselage bags are also made from quilted fabric for motorised model aircraft.

Even the hulls of sailing boats are wrapped by Pull Over.

model sailing boats are also delighted with the protective bags for their sensitive boat hulls and delicate sail rigs, which allow them to enjoy their beloved treasures for longer. ■

Philipp Gardemin

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Vincent and his father Alfons Merlijn are enthusiastic aeromodellers with an international reputation.

VINCENT, THE MODELLER

VISITING AVIATION TOYS IN THE NETHERLANDS

Alfons Merlijn is 77 years old and has been a keen pilot since he was 10 years old. His son Vincent has followed in his footsteps and now runs his company Aviation Toys in the Netherlands. Philipp Gardemin spoke to him and found out what the 'Rookie' free-flight model has to do with it.

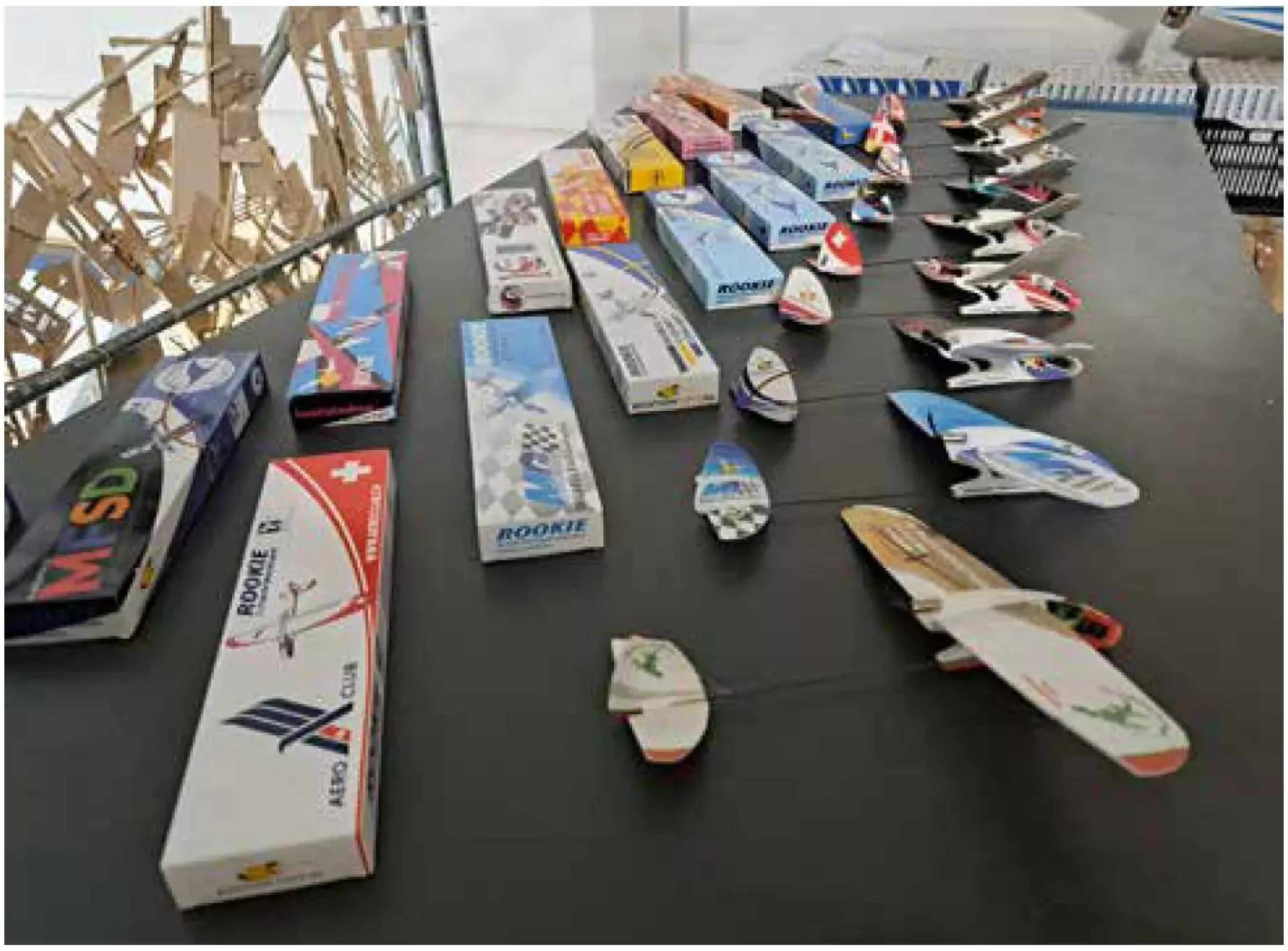
"Little Vincent had barely been able to hold a transmitter when he started flying model aircraft," recalls Alfons Merlijn. That was around 40 years ago. But Vincent, who is now 46, has tried many more things in his life: professional basketball, for example, and creating individual wall paintings for friends and customers worldwide. Vincent Merlijn never lost sight of model aircraft. He has built many models out of balsa and paper, including numerous free-flight models with and without rubber-band motors, but also a wide range of remote-controlled models.

Free-flight models have always been Vincent's great passion. It was only when he came into contact with LiPo batteries and modern electric drives 22 years ago that he became more involved in radio-controlled model aircraft. He discovered that flying F3K models was the ideal way to combine this with his old passion for free flight. He gained his first experiences in F3K with a used 'Twister 2'. Later, Vincent's focus was on self-built F3K models in positive construction. In 2014, he finally took part in his first competition and two years later, Vincent became the Dutch F3K champion. This motivated him to really take off and he switched to full CFRP models. With the 'CX-4' and later the 'CX-5', his personal performance increased significantly. The culmination of all his hard work and training: in 2017, Vincent Merlijn became F3K world champion in Ukraine.

But the real turning point came in 2019, when Vincent met friends from Asia who showed him the concept of an easy-to-build free-flight model with a small capacitor drive. He was thrilled and immediately realised that this type of model would be able to get children and young people excited about the sport of model flying. He further developed the concept and produced an initial small series of this model at home. The name of the model was also quickly found: 'Rookie'. At the F3K World Championship 2021, Vincent presented the concept to some representatives of the international aviation sports federation FAI (Fédération Aéronautique Internationale). They were very interested and demand also rose rapidly in the model sports scene itself. However, producing the model exceeded the possibilities of working from home. So, with the help of friends and family, the company Aviation-Toys was founded. "To date, many thousands of 'Rookie' models have been delivered all over the world and there is no end in sight," says Vincent Merlijn happily. Schools, clubs and associations, as well as specialist retailers, order them for youth days and events, sometimes in batches of several thousand. The individual printing and design of the 'Rookie' models is the concept's particular strength.

But relying on a single model concept is risky. So Vincent Merlijn went back to basics and designed glider models made of wood. He purchased a CNC laser cutter for production, found sources of high-quality balsa wood

In the F3K model flying sport, Vincent brought the world championship title to the Netherlands in 2017.



The 'Rookie' free-flight model with capacitor power system is the company's flagship and is flown all over the world.

At Aviation Toys, we also do series production: here the '2m' for a customer in the USA.

With the 'Habicht', Vincent Merlijn has produced a scale model for the first time. More will follow.

and took care of purchasing accessories. "My modeller friends are at my side, without them none of this would be possible," emphasises Vincent. The 'CX-RES mini' with a wingspan of one metre was the first model, followed by the '2m' with double the size and the ‚CX-Fling', again with a wingspan of one metre. All the models clearly show the genes of their designer with F3K experience. Vincent emphasises: "The models are anything but flying wooden gliders. They offer real gliding performance." Aviation Toys has also attracted international attention: a customer in the USA repeatedly orders ready-built '2m' gliders from him. The models are built and covered in long evenings and together with friends.

But for Vincent, a real fan of gliding, a classic model had to be included alongside all the functional models. So Vincent invested a lot of time and patience in the design of the aerobatic glider 'Habicht' with a wingspan of 150 centimetres. The model was to offer the gliding performance and penetration of an F3K model. Several wing profiles were tested until the ideal combination of safe and efficient flight behaviour was achieved. The concept was well received and the 'Habicht' has been and continues to be built and flown by numerous model pilots. Vincent now wants to continue this success and is currently planning a 'Grunau Baby' of a similar size. But until then, work is still being done on a 'Cirrus' with a wingspan of 170 centimetres. It will be the first model from Aviation-Toys with a GRP fuselage. The model's first public presentation at the Prowing trade fair exceeded all expectations.

The customer base for the Dutch models is worldwide. Many are in the USA – including Hawaii – in the UK and in Eastern Europe. "I still have many plans and ideas," Vincent concludes. We can be sure that we will be hearing and seeing a lot more from him. ■

Philipp Gardemin

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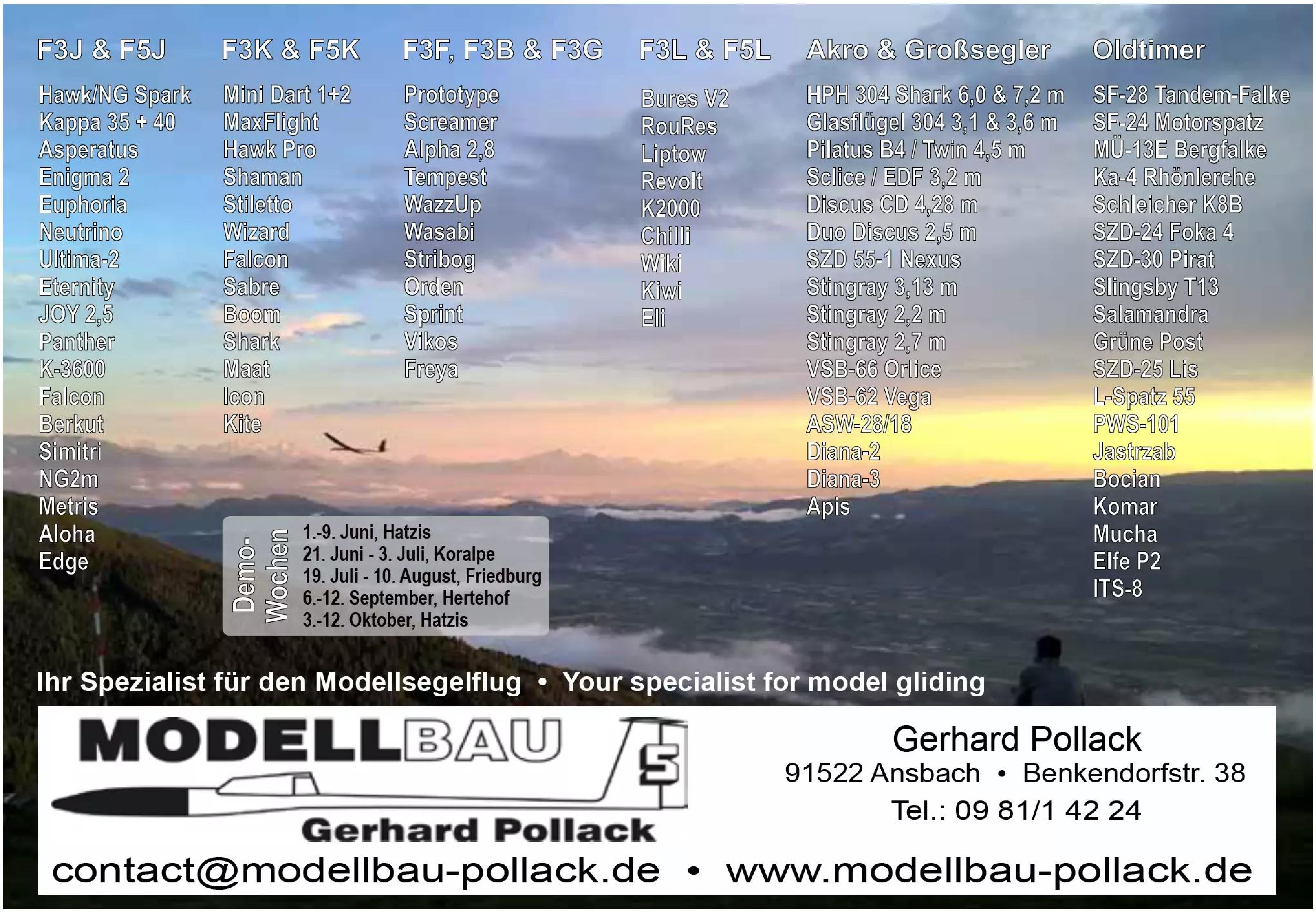

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GPS-NEWS

THE LATEST DEVELOPMENTS IN GPS TRIANGLE FLYING

SCALE CLASS IN WYHL

On 12 and 13 April, an open GPS competition in the scale class took place in Wyhl in southern Germany. A total of 608 triangles were flown in 101 flights, covering a total distance of 1,468 kilometres. Daniel Aeberli emerged as the winner with 4,974 points, followed by Holger Genkinger (4,962 points) and Michael Baumeler with 4,679 points. Daniel Aeberli once again used the large 'SB-10'. The model with a wingspan of 9.12 metres was presented in detail in AUFWIND 2/2025. In six rounds, he flew three grand scores. One flight with 829 points was cancelled. Holger Genkinger flew two models: four rounds were flown with the Quintus from Schambeck, now part of the TUN-Modellbau range, and two further rounds with the 'Nimbus 2C' from Chocofly. He achieved four scores in the thousands and one flight with 900 points was cancelled. Michael Baumeler also flew the 'Nimbus 2c' from Chocofly. It was only on the last day of the competition that he had to switch to the 'ASW-17s', also from Chocofly, due to a defect in the rudder. He flew one thousand-point score and ultimately cancelled one flight with 857 points.

Editorial team

CHOCOFLY
GPS

SPORT CLASS IN OBERHAUSEN, GERMANY

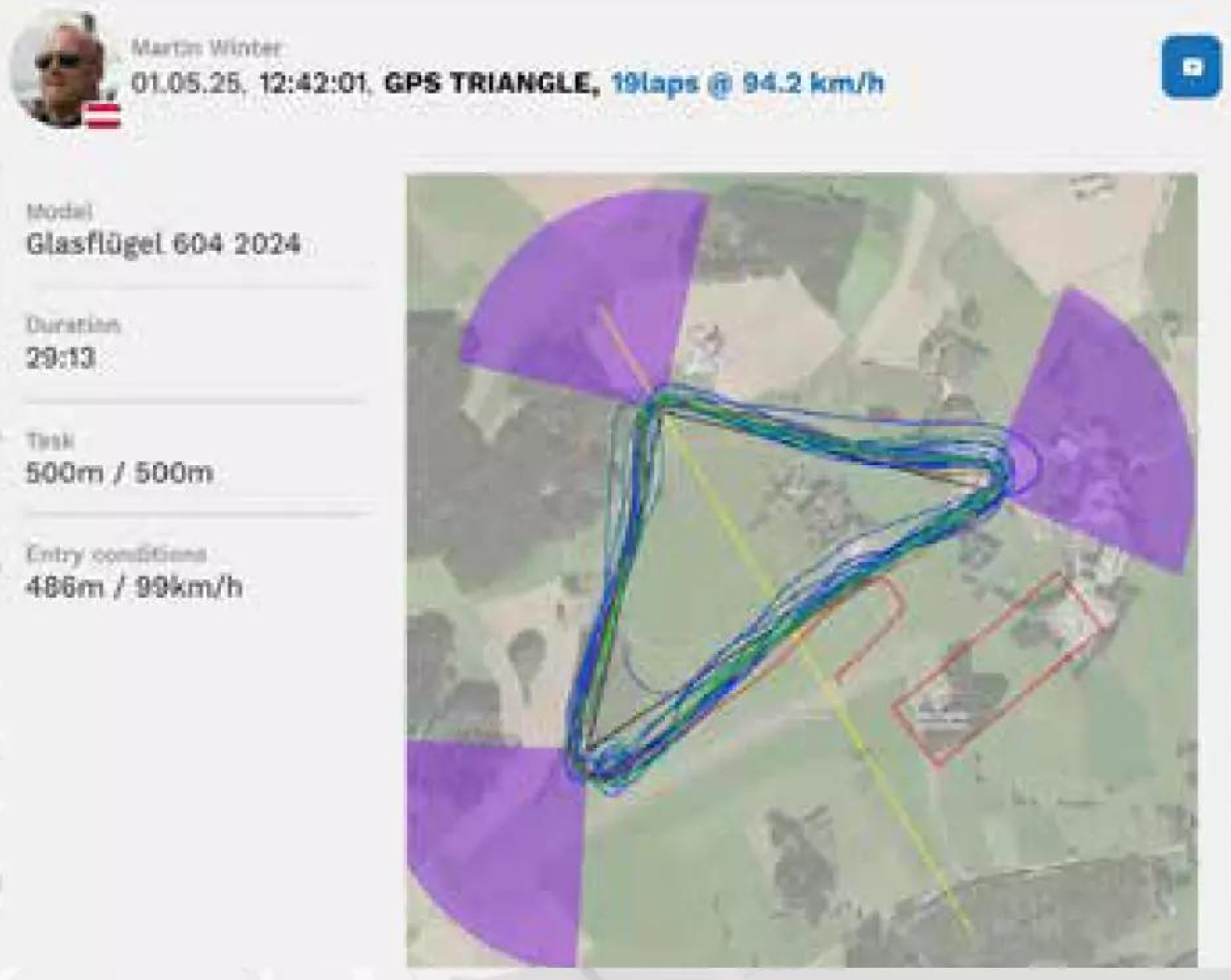
145 flights with 724 triangles and a total distance of 1,398 kilometres were flown in the Sport class competition on the first weekend of April in Oberhausen near Mannheim, Germany. 'We were able to complete a total of ten rounds with up to 12 triangles, in sometimes very strong winds and very strong thermals,' Benjamin Dähn concluded. Philip Kolb won with 8,765 points, followed by Daniel Aeberli (8,436 points) and Randolph Brömer (8,367 points). Philip Kolb flew the 'Pike Paradigm' from Samba Model, equipped with KST servos and a 'Schambeck Powerline 1930-9' drive with 6s LiPO flight battery and Vladimir 18 x 11 inch twist propeller. 'It was a fantastic weekend at MSV Oberhausen on a great flying site,' concluded Benjamin Dähn.

Editorial team

PIKE PARADIGM

SCALE CLASS: TWO IN ONE

With 2,223 kilometres flown in 921 triangles, the competition in Zell-Haidberg, Bavaria on the first weekend in May was the event for long flights. The average distance of the 101 flights was around 22 kilometres. Four pilots flew 19 triangles each: Daniel Aeberli and Martin Winter in the second round of Group A, and Andreas Kunz and Michael Kreß in Group B. Two competitions were held in parallel: the Contest Eurotour and the German Championship. After nine rounds, Oliver Pfister stood on the podium of the Contest Eurotour competition with a 'Glasflügel 604' from TUD and 7,515 points. Daniel Aeberli followed in second place. He flew the 'Nimbus 2C' and the 'SB-10' with a total of 7,445 points. Michael Kreß also flew these two Chocofly models and came in third with 7,317 points.



Martin Winter

01.05.25, 12:42:01, **GPS TRIANGLE,** 19laps @ 94.2 km/h

Model
Glasflügel 604 2024

Duration
29:13

Task
500m / 500m

Entry conditions
486m / 99km/h

In the German Championship standings, Michael Kreß took first place, followed by Thomas Schorb (7,252 points) with the 'Glasflügel 604' from TUD and Holger Genkinger with 7,178 points. He flew the 'Nimbus 2C' from Chocofly and the 'Quintus' from Schambeck and TUN-Modellbau.

Editorial team

24–27 JULY: 1ST LIGHT CLASS WORLD CHAMPIONSHIP

Already 34 participants (as of 7 May) have registered for the first World Championship in the popular Light Class. They come from Germany, France, Great Britain, Italy, the Netherlands, Norway, Portugal, Switzerland, Slovakia, Slovenia, Spain and the Czech Republic. Up-to-date information is available at www.mfc-heudorf.de/gps-light-weltmeisterschaft-2025/. The event is being hosted by the Heudorf Model Flying Club in southern Germany.

Editorial team

GPS LIGHTCLASS 2025 WORLDCHAMPIONSHIP

Powered by CHASERVO® CHAMPIONSHIP PERFORMANCE

DATES AT A GLANCE

Academy
27-28 September; AUFWIND Scale 1:3.5, Bieselsberg (GER)

Sport
5-6 July; Bishop Norton (GBR)
23-24 August; Munich (GER)
4-5 October; Erbach (GER)

Scale
28-29 June; Burgkunstadt (GER)
12-13 July; Wächtersberg (GER)
2 - 3 August; Stappenbach (GER)
16-17 August; Gaimersheim (GER)
08-12 September; World Masters, Vipava (SLO)
17-18 October; Roquetes/Tortosa (ESP)

Light
14-15 June; Bieselsberg (GER)
12-13 July; Ede (NED)
24-27 July; World Masters; Heudorf (GER)
30-31 August; Radolfzell (GER)
20-21 September; Hofhegnenberg (GER)

Hintergrundbild: freepik, rawpixel.com

ALL-ROUNDER WITH PERFORMANCE

THE 'FORZA' FROM CRG – PART 2

With the ‘Forza’ from Composites RC Gliders (CRG for short), Markus Thewes has built a versatile all-round model with an electric and gliding fuselage. In the last issue of AUFWIND, he described the precise construction of the wings. Now we continue with the electric fuselage, the drive and the flight performance.

Für den Ausbau des To build the fuselage with the electric motor, the installation positions of the rudder servo, motor controller, receiver and drive battery in the fuselage were determined. To do this, the model was assembled and placed on the centre of gravity balance with the aim of selecting positions that would not require any trim weight to achieve the centre of gravity.

The drive consists of a Leomotion motor ‘LEO 2820GC-0810’ or ‘Dualsky XM3844EG-12’ (32/38 mm, 161 g). It has 14 poles, 810 KV and a maximum power output of 640 watts. The propeller is a CAM-Carbon Z 14 x 8 inch with a 40 mm diameter Z-spinner from Aeronaut. With the resulting system weight of approximately 200 grams in the nose of the fuselage, it was clear that the position of the flight battery would have to be moved far back. A 3s LiPo SLS ‘Quantum 40C’ with a capacity of 2.2 ampere hours was to be used as the flight battery. With these components, the centre of gravity balance indicated a flight weight of 2,100 grams at the desired centre of gravity of 94 millimetres. Bull‘s eye!

The ‘Forza’ fits perfectly into the range of applications as a dynamic all-rounder on slopes in medium and strong conditions.

The receiver was placed directly in front of the wing-connector on a small plywood board. This was glued high enough so that the flight battery would fit underneath. The servo for the rudder was then positioned so that the flight battery could be easily inserted and pushed back. This would also allow the motor to be pulled out of the nose of the fuselage for servicing without having to remove the servo or its mounting bracket. The motor-controller was placed next to the servo on a small board. The ‚Unisens-E‘ module from SM-Modellbau, which is responsible for the telemetry, underneath. Due to the limited space available with this arrangement, a small but powerful ESC with a continuous load of at least 60 amps was now required. I also found what I was looking for at Dualsky and opted for the ‘Summit 60X’ in the HV version with eight volts BEC voltage and five amps continuous load capacity. This compact controller, distributed by Lindinger Modellbau, has a stylish aluminium housing that also helps with thermal management and can be easily programmed on a computer using the free ‘BL Heli-Suite’ software. In addition, the controller already had the right connections to the motor and

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01 I 02 A copy of the inside of the fuselage was made with hot glue and could then be recast in lead.
03 The ‘LEO 2820GC-0810’ Leomotion motor weighs just 161 grams and has a maximum output of 640 watts. The propeller is a CAM-Carbon Z 15 x 8 inch with a 40 millimetre diameter Z-spinner from Aeronaut.
04 The CFRP engine bulkhead was glued into the nose of the fuselage with a small offset to the rear.
05 The glider fuselage with the rudder servo, the receiver and the 2s LiIon receiver battery.
06 The small and slim ‘Summit 60X’ controller from Dualsky offers eight volts of BEC voltage with a continuous load capacity of five amps.

Spring temperatures were still low for the glider‘s first flight on the slope.

an ‘XT60’ gold plug for connecting the flight battery. The controller also has an acoustic location function that emits a signal tone after 30 minutes of inactivity. If you don‘t want this, for example because it interferes with gliding, you can deactivate the location function via the programming.

Back to the non-powered version of the ‘Forza’, which I built at the same time as the electric fuselage: in order to get as much lead as possible into the narrow nose of the fuselage and as far forward as possible, I made an impression of the inside of the nose and used this as a positive mould for casting a suitable lead insert. To do this, I pour liquid hot glue into the nose. I also cast a wire into it. This allows me to pull out the hot glue block again after it has hardened. To prevent the hot glue from sticking to the tip of the fuselage, I oiled it from the inside beforehand. Warming the nose in a warm water bath also helps to loosen it. With a positive mould like this, it is easy to create a sand mould for casting with lead.

The centre of gravity balance required approximately 220 grams of lead in the front part of the fuselage for the glider version of the model. This resulted in an almost identical take-off weight of 2,050 grams for the glider version compared to the electric version. Once the lead block was firmly glued in place, a threaded insert was screwed into the lead so that a removable bungee-hook could be screwed in.

I wanted to make the maiden flight of the ‘Forza’ with the electric version in order to check all the settings and incorporate any trim corrections into the programming, which could then simply be copied to the glider. I also wanted to finalise the centre of gravity and transfer it to the glider as the starting value. A warm and sunny weekend in spring provided ideal conditions for the maiden flight. My colleague and photographer Robby also had time, so nothing stood in the way of the maiden flight. The motor didn‘t pull the ‘Forza’ into the sky quite as quickly as expected, but the climb performance was sufficient and the drive was surprisingly quiet. The battery capacity was sufficient for several climb flights, so that minor trim corrections could be made at leisure. The effect of the brake flaps could also be tested. With a flying intercept arc, I also found that the centre of gravity could be shifted slightly rearward by moving the battery.

The excellent dynamics of the ‘Forza’ were already evident during this first flight. When pressing down, speed was quickly built up and, despite the relatively low weight and the slightly higher drag in the electric version, it was also well maintained and converted back into altitude. The rudder response was very direct on all flight modes and required a significant increase in the expo value in the programming. These characteristic suits the model perfectly and gave me exactly what I had hoped for.

I was surprised by the good-naturedness of the ‘Forza’ in slow flight and during landing. The model can be slowly brought in with good control

FACTS

The ‘Forza’ from CRG

An all-round model with performance

Wingspan	2,500 mm
Length	1,240 mm
Weight	
Electric flight	2,100 g
Gliding	2,050 g
Wing area	46.66 sq. ft
Wing loading	
Electric flight	45.01 dm^2
Gliding	43.93 dm^2
Price:	**979,- euros**

Available from Composite RC-Gliders,
phone: +49-2405/4067752,
www.composite-rc-gliders.de

The „Forza“ is a dynamic all-rounder and not a thermal creeper.

Control surface settings

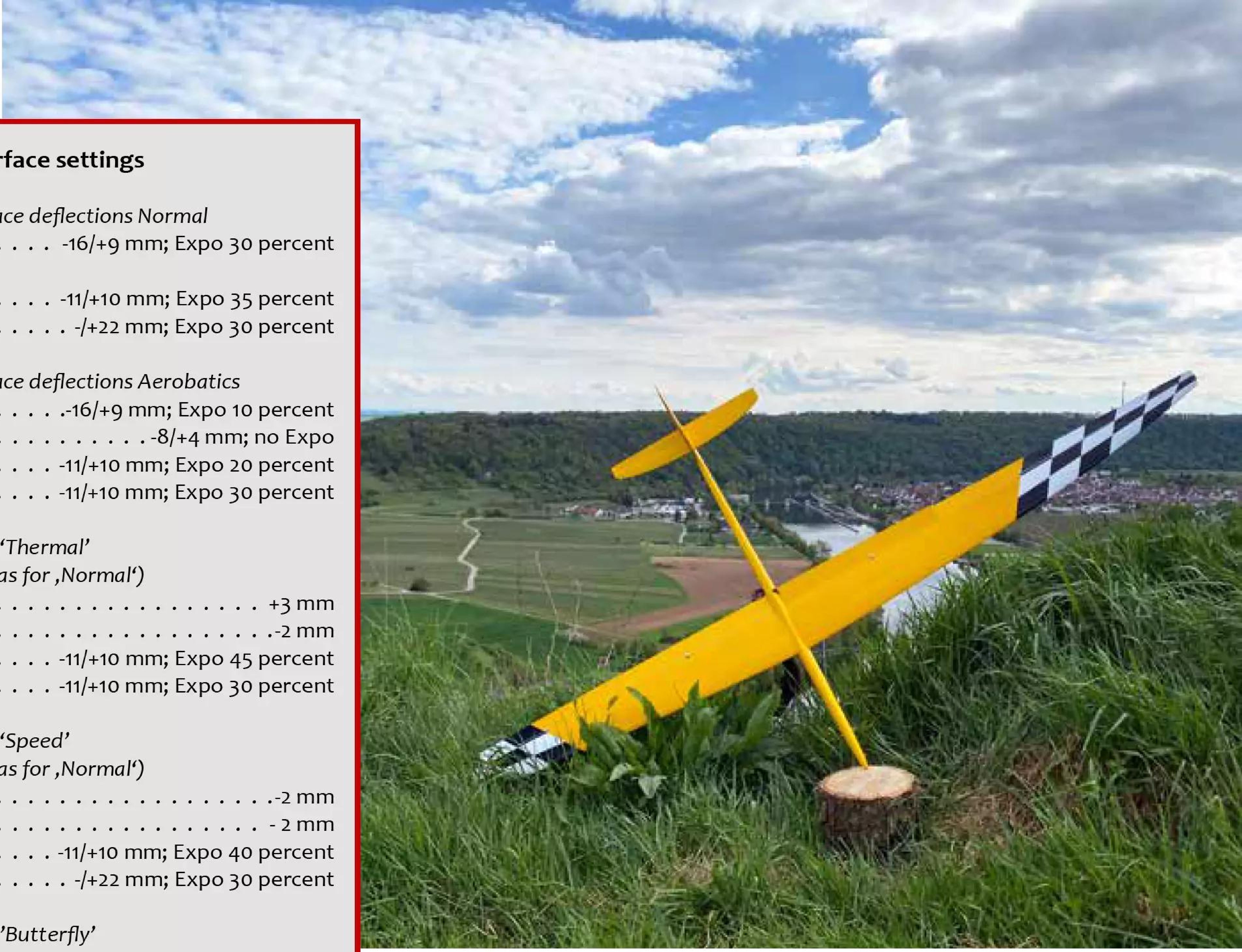
Control surface deflections Normal
Ailerons . . . . . . -16/+9 mm; Expo 30 percent
Flap
Elevator . . . . . . -11/+10 mm; Expo 35 percent
Rudder . . . . -/+22 mm; Expo 30 percent

Control surface deflections Aerobatics
Ailerons . . . .-16/+9 mm; Expo 10 percent
Flap . . . . -8/+4 mm; no Expo
Elevator . . . . . . -11/+10 mm; Expo 20 percent
Elevator . . . . . . -11/+10 mm; Expo 30 percent

Flight phase 'Thermal'
(deflections as for ‚Normal')
Ailerons . . . . +3 mm
Flap . . . . -2 mm
Elevator . . . . . . -11/+10 mm; Expo 45 percent
Elevator . . . . . . -11/+10 mm; Expo 30 percent

Flight phase 'Speed'
(deflections as for ‚Normal')
Ailerons . . . . -2 mm
Flap . . . . - 2 mm
Elevator . . . . . . -11/+10 mm; Expo 40 percent
Rudder . . . . -/+22 mm; Expo 30 percent

Flight phase 'Butterfly'
Ailerons . . . . -7 mm
Flap . . . . +44 mm
Elevator +9 mm (multi-point curve, not linear)



and, with sufficient space, slowed down nicely until just before the ground without becoming critical near the ground. Even when circling in thermals, the model behaved very well, contrary to my 'choppy' expectations based on the wing shape. With its slightly downward-curved profile, the 'Forza' remains stable and easy to control even in slow flight. This even allowed me to fly my first thermal with the 'Forza' in the late afternoon. However, if you overdo it with the slow speed, the model will have a soft tip stall, but it is quickly controllable again. Its design and wing configuration make it a dynamic all-rounder rather than a thermal glider.

After the first few launches, we got to the bottom of the obviously insufficient power output. According to the telemetry data, only about 30 amps were flowing instead of the calculated 45 amps. Replacing the 'CAM-Carbon Z 14x8' propeller with a 15 x 8 inch model reduced the current even further instead of increasing it, and as a result, no more propulsion power was available than before. The reason must therefore have been in the control system. The cause was found in the parameters of the controller software: the controller was throttled to 50 percent during start-up. After this was adjusted via the 'BL Heli-Suite', the full power of around 600 watts (approx. 50 amps of current at standstill with 12 volts battery voltage) was then available. This was in line with the characteristics of the 'Forza'.

After the positive impressions on the first day of flying, I was looking forward to the first use on the slope. The conditions were rather moderate, the lift was strongly thermal and there was no slope wind. The 'Forza' performed excellently and did not need to hide from other F3B and F3F models. With a slightly cambered profile and sufficient speed when circling, it was possible to gain altitude repeatedly without using the motor and then fly away again with even more speed and great flying pleasure. On this day, the 'Forza' once again clearly demonstrated what it was designed for. I was now looking forward to the next few days with more wind so that the unpowered version of the model could also show what it was made for on the slope.

A few days later, the conditions were so promising that I decided to load with full ballast. After flying the electric version, I moved the centre of gravity back to 97 millimetres, which proved to be just right for the glider version: the 'Forza' was very dynamic, maintained its speed over long distances and never became critical during landing, even with the additional load. At first glance, the glider version seemed even more agile than the electric version, and my anticipation for more windy spring days on the slope grew with every minute of flight.

In the end, I am convinced that the 'Forza' from Composite RC Gliders fully meets my expectations in terms of dynamics and even exceeds them in terms of good-naturedness. The model fits perfectly into the range of applications as a dynamic all-rounder on slopes in moderate and strong conditions. Its compact size and robust design make it particularly suitable for small slopes with moderate landing conditions. Its dynamics also make the model a lot of fun to fly. ■

Markus Thewes

INFO

The first part of the article was published in AUFWIND 3/2025. The issue can be reordered in the AUFWIND shop.

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KAVAN
CUMUL

THE WOOD CLASS

THE ‘CUMUL 100’ FROM KAVAN

Ingo Kalke had been looking for a wooden electric glider model for a long time. The ‘Cumul 100’ from Kavan, with its 2.54 metre wingspan, was just what he was looking for.

I wanted a powerful electric glider that was not too big and not too light. The Czech manufacturer Kavan advertises the model with precisely these characteristics. As I know that the kits are manufactured to a very high standard, I couldn‘t resist buying the model. I was also able to order the servos and the entire drive system from the Kavan range.

As soon as I received the kit, I couldn‘t wait to start building the beautiful wooden model: all the parts were sorted and packed in bags. The assembly instructions was a small illustrated small paperback booklet in Czech and German. Three rolled planes were also provided. While the assembly instructions were written in bullet points, the construction plans revealed all the secrets of the build. The assembly instructions also included colour pictures in the Czech section.

The construction manual begins with the assembly of the tailplane. No construction plan was actually necessary for the tailplane, which was designed as a flat plate: the outer frame is milled and ready, and all that remains is to glue in the struts, which are also milled to fit precisely and therefore cannot be mixed up. The two elevator flaps were milled from solid wood and still had to be ground to a conical shape. A strip of balsa wood was inserted into the rudder to interrupt the vertical grain and prevent warping. It all feels really stable, but also light.

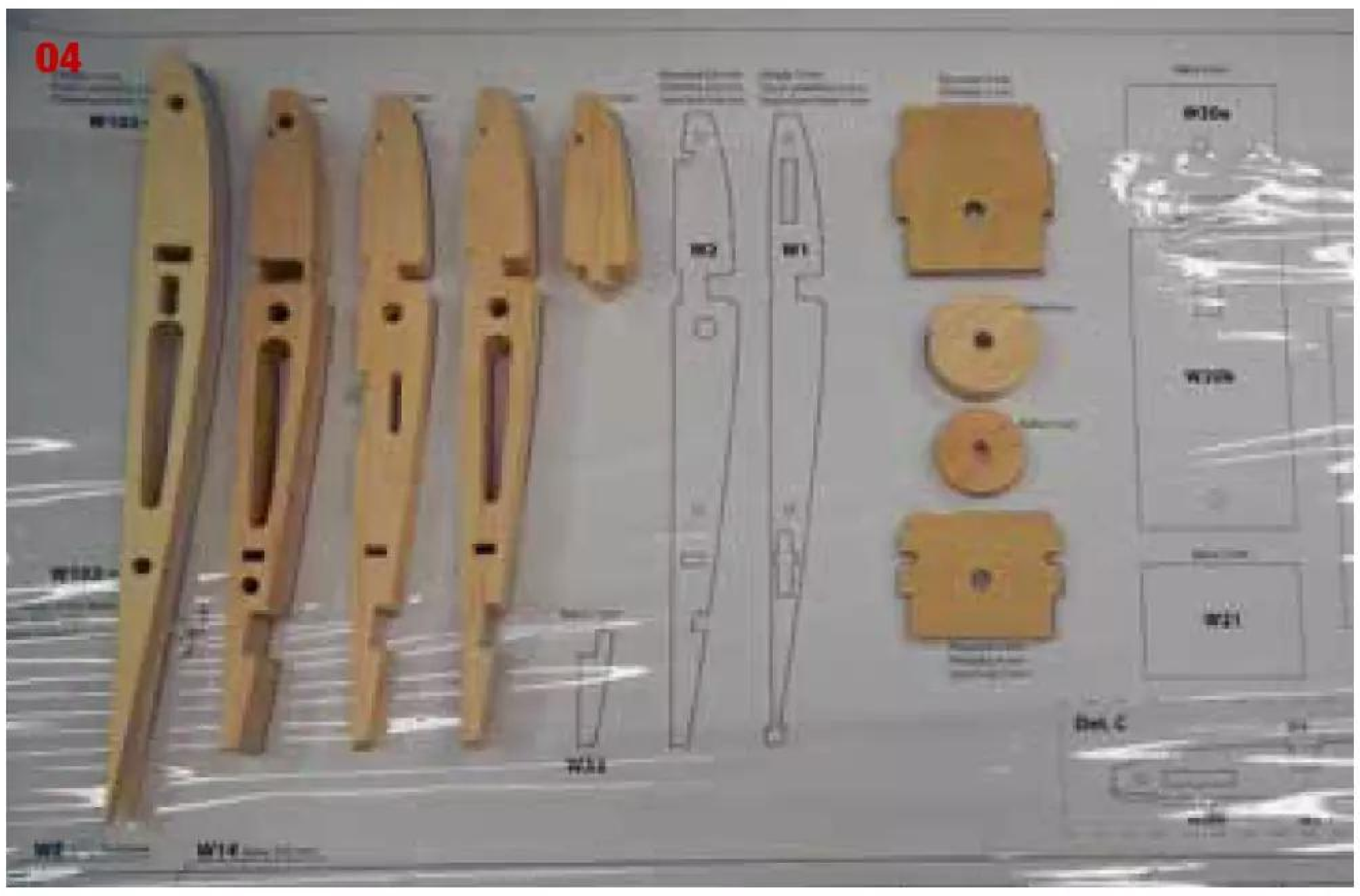
The next step was to build the wings, which did not require a building rig. I was able to sort the required ribs directly on the construction plan.

They are actually all marked individually. The designation is then noted in the plan and each rib can be assigned. The spars were built in advance. Here, the mounting of the joiners had to be reinforced first. For this purpose, a Kevlar cord was provided, which was wrapped around the wooden structure and then glued with epoxy resin. The two ribs with the servo mounts could also be prefabricated. I could blindly trust the dimensional accuracy, as they later fit perfectly into the cut-outs of the tailplane and the main spar. The recommended 'GO-1023MG' servos from Kavan fit into the cut-outs of the servo holders. A flat pine strip was glued to the top and bottom of the balsa spar. This resulted in a sturdy double-T spar which makes the wing very rigid. Another pine strip was pushed through all the ribs. Half ribs were also glued in the area of the D-box. Finally, only the upper side was planked. This ensures high profile accuracy in the right places and also saves unnecessary weight. In the centre section of the wing, the designer also thought of the eight-pin connector, which was included in the kit. The opening had already been milled out and a reinforcement of the balsa planking made of plywood was glued onto it. The milled end strips were also a highlight: they are very wide, which prevents warping due to the tension of the film when it is applied later. The flaps and ailerons were built together with the wing and were later cut off with a Japanese saw. The centre section of the wing was built very quickly.

Now it was time to move on to the outer wing sections. Here, too, the spars were prepared first, the plugs were wrapped with Kevlar cord and everything was assembled according to the plan. The main spar is only reinforced with pine in the area of the ears; a balsa strip was sufficient for the winglets. Putting the whole wing together for the first time was a joy. Everything fit well and the entire wing had an empty weight of just 309 grams. The CFRP wing joiners gave the wing panels a four-degree V-shape towards the centre section. The winglets were then glued on at the same angle to the outer parts of the wings.

To establish electrical contact between the centre section and the outer sections, openings were milled into the end ribs to fit the three-pin XT connectors. I was then able to simply solder and glue these in place. The eight-pin connector was then soldered into the centre section of the wing and the counterpart screwed into the wing mount in the fuselage. Now the wing could be fitted and screwed into place. The plug in the wing was inserted and glued into the planking with hot glue. Instant glue is not

01
kavanrc.com



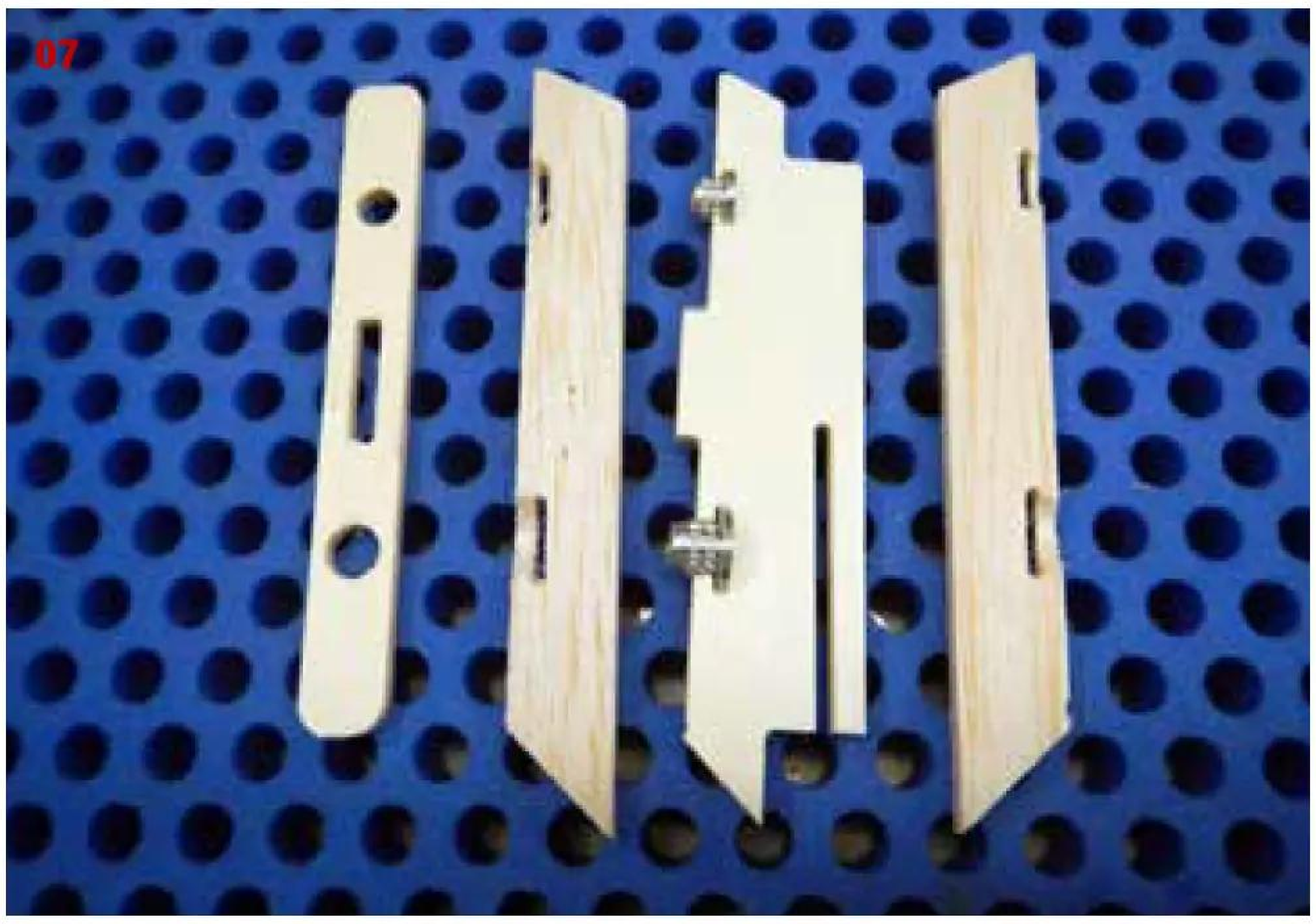
01 **The kit contains high-quality components.**

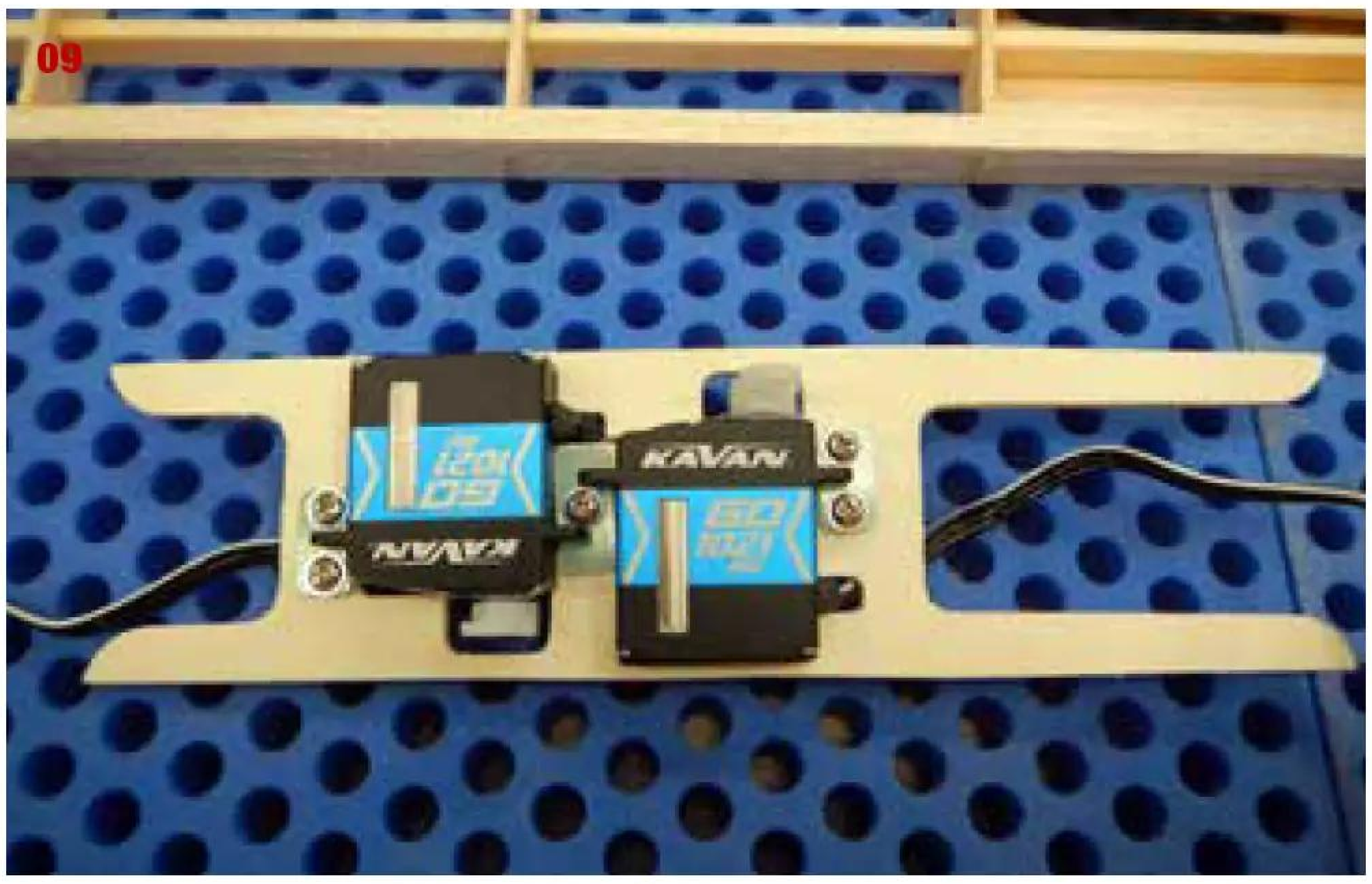
02 **The tail unit is very easy to assemble thanks to the precise milled parts.**

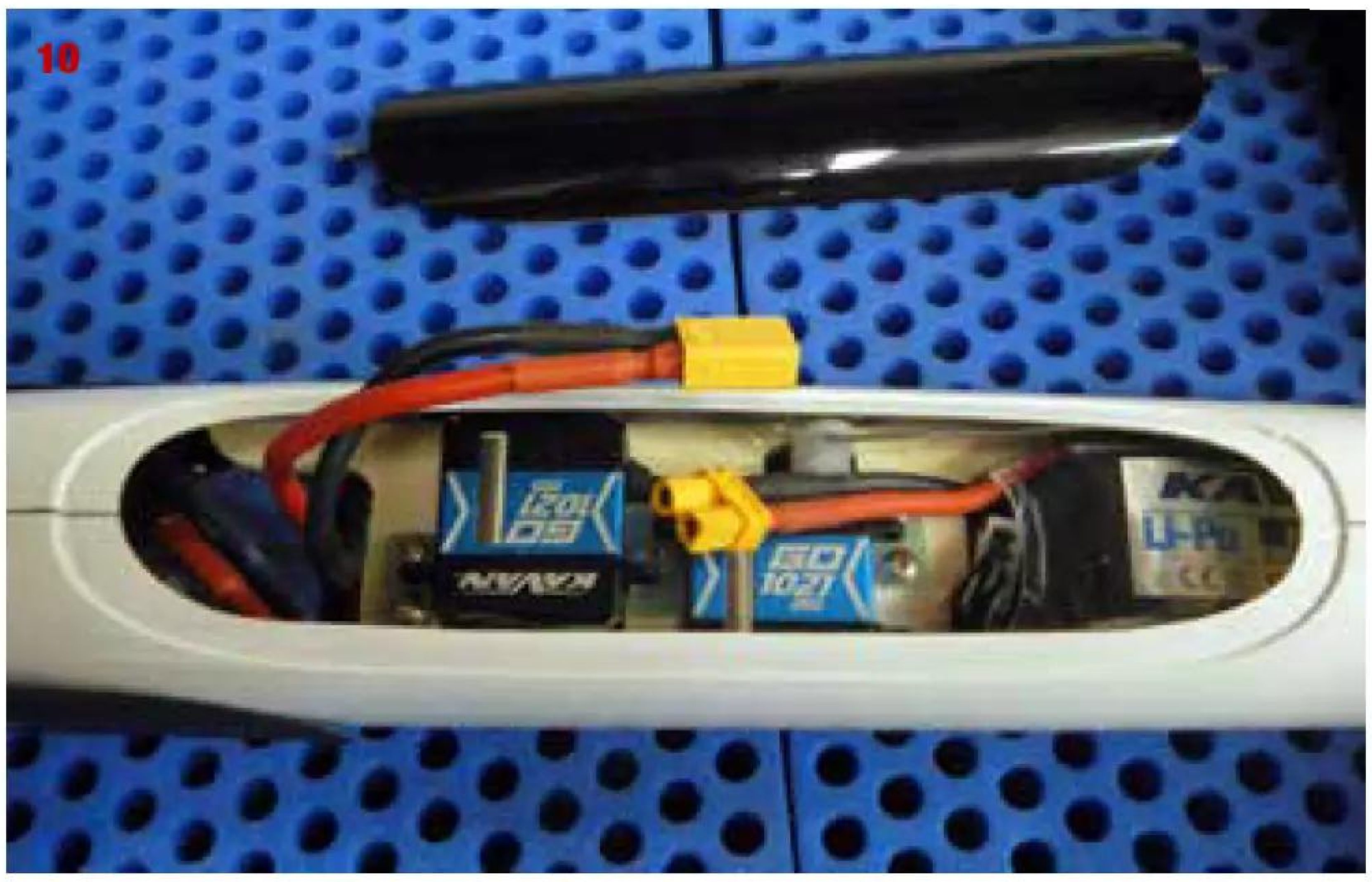
03 I 05 **The stable and easy-to-assemble centre wing section. The mounting frame for the eight-pin connector is clearly visible in the area of the fuselage contact.**

04 **All wing ribs are shown on the plan. This makes it very easy to sort and assign the milled ribs.**

06 **The entire wing weighed only 309 grams when assembled.**







07 The pylon for the tailplane is constructed from several layers of wood. The screw sleeves for the screw connection are glued in place.

08 The recommended Kavan servos fit the model perfectly and can be installed without modification.

09 I 10 The servos for the tailplane rudders are also mounted horizontally and are easily accessible through the fuselage cover.

recommended here, as it usually runs through to the mating plug – with disastrous consequences.

At this point in the construction process, it has only taken a few afternoons of work. After testing the four servos in the wing, the components could be covered. The blue-transparent Kavan iron-on film used in some areas fits the model perfectly and allows the wonderful wooden construction to be seen.

I attached the landing flaps to the underside of the centre section with transparent adhesive tape and the ailerons to the top. Since the wing flaps are used to support the ailerons, I sanded them at an angle of 27 degrees upwards. This is also recommended by Kavan and has proven itself during subsequent flying. A small design flaw became apparent in the aileron horns. Kavan included everything needed to build the model, including the milled fibreglass aileron horns and the plastic fork heads with brass pins. The pin has a diameter of 1.7 millimetres, but the hole in the aileron horn is only 1.2 millimetres. When I tried to enlarge the hole, the material around the hole broke away. So I had to mill new aileron horns.

This completed the wing construction. Also worth mentioning: the milled holes in the planking of the centre wing section for attaching the wing to the fuselage fit very precisely, and the alignment of the wing to the fuselage longitudinal axis was perfect.

Back to the tailplane, because the pylon for mounting the horizontal tailplane on the fuselage boom still had to be built. Here, too, there was no room for error. The nuts were inserted into pre-milled slots, then side pieces made of balsa wood and a support were placed on top. I used white glue for the bonding. This also allowed the nuts to be glued in place. The form fit ensures that everything holds together perfectly. I thought for a while about what the milled slot on the pylon inside the fuselage tube could be for. The solution: the Bowden cable tube would go in there later. However, the opening on the boom itself still needs to be milled out for this. The slot provides the correct distance to the horizontal tailplane and also acts as a guide in the fuselage boom. The pylons were then glued to the boom with ‘UHU Endfest 300’. Since the milled slot in the boom was slightly longer than the pin at the bottom of the pylon, it can be glued in such a way that the rear edge of the elevator will later have sufficient clearance from the fin. I then simply decorated the pylon itself with black Orastick film. This weighs almost nothing, holds well and requires very little effort. The vertical stabiliser was now also covered with film and glued to the boom at right angles to the elevator using a little epoxy resin. The installation slot for this had already been milled by the manufacturer. The kit included three small plywood discs for the two Bowden cable tubes. These were threaded onto the tubes and pressed into the fuselage boom one after the other with small drops of glue. This gave the tubes a perfect hold.

Now I could glue the fuselage boom with the horizontal tailplane mounted and the wings screwed on into the front part of the fuselage. All I had to do here was sand the surface of the mounting on the fuselage a little, then the CFK boom fit perfectly and could be aligned using the wings and the horizontal tailplane. A zero-degree angle between the horizontal tailplane and the wing proved to be the optimum setting. The profile chord then gave the correct angle for the wing. However, the angle itself can also be changed by carefully sanding the pylon mounting surface.

The beautiful model now stood before me in all its glory. But there were still a few steps left to complete the fuselage. I cut off the fuselage tip using the template provided and installed the Kavan ‘C2836-1050’ motor with the motor bulkhead also included in the kit. However, space is very tight at the front. Due to the cables protruding from the side of the motor housing, the

Take-off is easy: start the motor, release the model straight ahead and enjoy long flights.

The flight characteristics are flawless, the ‘Cumul 100’ is very pleasant to fly.

FACTS

The ‘Cumul 100’ from Kavan

A thermal glider to build yourself

Wingspan	2,540 mm
Length	1,435 mm
Weight	1,009 g
Wing area	55.9 dm^2
Wing loading	18.05 dm^2
Price	**339.60 euros**

Available from specialist retailers and from Kavan, www.kavanrc.com

The butterfly position slows the model down considerably and allows it to land accurately.

bulkhead with the motor screwed on was very reluctant to go all the way forward. However, there was more space above. I created some more space with a small grinder.

For the servos for the ailerons and elevators, I had the choice between the 'GO-1020MG' (vertical installation) or the 'GO-1021MG' (horizontal installation). The servo boards for both versions were included with the model. I opted for the horizontal servos so that the 40 A regulator for the motor could be placed under the servo board and have enough space. At first glance, I noticed that there was actually no room for a flight battery. But after connecting the Bowden cables to the servos with a simple Z-bend and routing them along the side of the fuselage, a niche appeared behind the servos. A test on the centre of gravity scale showed that a 3s LiPo with 750 milliampere hours would fit perfectly here. There was still room further back in the fuselage for the receiver (a Jeti 'Rex 7'). The result was that the interior of the fuselage looked nice and tidy. For the drive, Kavan recommends a 10 x 6 inch folding propeller. I got the spinner with a diameter of 32 millimetres and Z-mount from Aeronaut. This means that the propeller fits nicely and the shape also suits the model perfectly.

The model's centre of gravity was right straight away. Kavan specifies a centre of gravity range of 77 to 81 millimetres. I set the centre of gravity at 78.5 millimetres with a weight of 1,009 grams. The flight weight of 750 grams specified by Kavan is probably only achieved with the glider version. After only 21 evenings of construction, the 'Cumul 100' was ready to fly.

Assembly at the model airfield then proceeded quickly. Kavan did make one small mistake: four screws are required to attach the wings and the tailplane. You actually need four different screwdrivers to assemble them. For the wing, you need 2.5 and 3 millimetre Allen keys, and for the tailplane, you need a larger and a smaller Phillips screwdriver. This is annoying, and I will look for another solution.

But now to the first flight of this beautiful model: the 'Cumul 100' pulled up at a nice angle. After only ten seconds, it was high enough and the motor was switched off. A few trim clicks to the right and on the elevator were necessary, then everything was fine. The tailplane showed some top-heaviness. So I quickly returned to land and was able to test the flap position at the same time. I lower the flaps in the first phase and, halfway through the stick movement, the ailerons also move upwards. This slows down the aircraft considerably and, with a little elevator input, the 'Cumul 100' obediently points its nose downwards.

For the second flight, I temporarily stuck five grams of weight under the tailplane. The model was now like a different aircraft. It flew slowly enough to indicate thermals well by a wobble of the wings. The rudder was now also very effective and I was able to counteract this excellently with the ailerons. There weren't many thermals on this cool February day. Nevertheless, I was able to fly for almost 20 minutes with only 54 seconds of engine running time. In the thermal phase, the 'Cumul 100' became very slow and held its position even in the slightest updraft. With the flaps slightly raised, it became a little faster.

The strength of the wing was also tested, albeit accidentally: After a tight loop, it descended a little too quickly and when levelling off, the winglets fluttered noticeably. However, the winglets remained attached to the wing and the structure was undamaged. I haven't flown any tight manoeuvres since then; big loops are enough. For rolling, the ailerons should be supported by the flaps; with just the ailerons, it takes quite a while to complete a full turn.

In short, building it was great fun and everything went smoothly. In terms of flying, the 'Cumul 100' is exactly what I wanted: a handy thermal glider that can creep along nicely and looks good too. Or to put it another way: it doesn't always have to be four metres or more in wingspan. ■

Ingo Kalke

Photos: Ingo Kalke, Philipp Gardemin

The question of glue

The assembly instructions recommend superglue for most parts, with slow-setting white glue only for components that need to be adjusted. However, for kits that require such a precise fit, I prefer the 'Super Phatic' glue from the Krick Modelltechnik range. This is a thin-flowing adhesive for wood that penetrates deep into the material and dries there. Its final consistency is similar to wood glue, but it can also be used after the parts have been joined, as it penetrates the joints through adhesion. This means that the construction is not as brittle as with superglue and it only takes a little longer to dry.

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F3F-SCENE

A LOOK AT GREAT BRITAIN

With the 'Saker', Ian Mason has developed an F3F model for beginners to the fascinating world of gliding.

Ian Mason is an enthusiastic F3F pilot and has deep insights into the scene in his home country of Great Britain. He has developed a model called the 'Saker' and explains how he tailored it precisely to the F3F flight task.

As the 2024 British F3F season came to it's climax at the Hole of Horcum, it ended one of the most successful league seasons for several years. Starting on a cold spring day on the Bwlch our travels around the country have taken in a wide range of conditions and slopes. I think the British league can claim to be one of the most diverse in terms of the types of slopes raced. Alongside those ballistic days on the famous Wrecker you have to be able to nurse your model around the very much more sedate Long Mynd. Being a master of many different turns and techniques is vital for anyone hoping to do well. From my vantage point at the back of the field, it's clear that the quality of flying and commitment to practise with single model designs continues to climb.

My own highlight of the summer was the 3 days of glorious racing in East Sussex for the South of England Open. Euro tour events are always a huge amount of fun a chance to catchup with friends from further afield is to be savoured but when combined with good winds and sunshine – what's not to like? At the race it was great to see pilot legends such and Deiter Perlick fly the latest iteration of his Caldera. I've always had a man crush on the Caldera a design that has been developed and flown for over 10 years, it was fantastic to see the T tail version fly. Over the 3 days it was fascinating to see visiting pilots get to grips with the British conditions. Markus Meissner led the way, finishing at the top of the table with 11,893 points, followed by Mark Redsell (11,822) and Peter Kowalski (11,819).

Just missing out on a top 3 spot was John Philips, Day 2 saw his first outing with a new F3F model- the Saker. Despite winning day 2, a wiring problem stopped John from racing his Saker on day 3 but it was clear to all of us that John and his Saker had 'bonded'. John raced the Saker for the rest of the summer and embarked on one of the most dominant season that I can remember. The English Open, Welsh Open, British league and finally the Euro tour trophies were taken home by John. Whilst individual race results can be an unreliable measure of a model's potential, after such a remarkable season the Saker deserves a second look.

The shapes were intricately milled to enable series production.

A little more about the Saker: Full disclosure first, the Saker is my design and part of a long-term mission of mine to make more affordable high-performance models available. I don't sell the models or have any interest in them once I have made the designs available. I love racing and flying F3F models but I am very aware that the cost of these models has steadily increased over recent years. I fear for the effect that this could have on our sport and so the idea of managing to produce 3,000-euros-performance for 1,000 euros is a tantalising goal.

Of course, the 'Saker' is also available in various colour combinations.

Ian Mason: "The 'Saker' is a model that I have enjoyed watching win round after round."

In recent years the colour scheme has become the most reliable way of identifying which of the different F3F designs is flying. This is not too surprising, afterall, if you keep asking the same question then it's likely that you will get the same answer and you cannot argue with the performance of the models available.

I have worked with CAD engineer Mike Francis over a number of years, one thing I have learnt is that there are some really great guys out enjoying our sport- just like Mike. Like many of us who enjoy spending time away from the crowds on I enjoy approaching questions from a different direction. Whist every design I have produced has come with aspects that I would do differently next time, there has also been elements which have worked well on the slopes. I value practicality and ease of ownership as highly as aerodynamic performance- all aspects of design that I don't think you can assess until you are on a slope with your model.

A three metre wing span has proved itself as being very suited to slope flying and racing. The wing section I used is a little thicker than some, at 8.3 per cent but after using it on the 2.55 metre 'Falcon' I know just how fast it is. I am not a fan of blending wing sections but I believe that as the demands on different parts of the wing changes, different sections will optimise this. Where possible, I try to maintain step changes between the different sections, so that the section wanted is actually there and not a blend.

Planform can be one of the most critical aspects to a model's success. Easy to fly- not too critical to mistakes when carrying energy around the course. With thumbs like mine, messing up a turn is always a possibility and so making the turns as easy as possible is a prime objective. The Saker's planform has delivered predictability over the wide range of conditions seen through the UK.

Whilst a 3 metre wing span is following trend, the Saker's fuselage is the element of the design which has turned a few heads. I have never been a fan of very small fuselages. This is for a number of reasons- my fat thumbs make it difficult to fit the necessary radio gear in to the smallest of spaces as well as making it quite likely that I will end up hitting the model against the different slopes I fly on.

Although when flying in a straight line, a slimmer fuselage may give a marginal drag reduction. Just how much of an F3F run are you flying straight and level? I decided to maintain the mechanical strength of a wider deeper fuselage and use the fuselage's shape to guide the airflow over the fuselage. If the air can be channelled smoothly under the wings then that air would still be smooth enough to maximise the effectiveness of the V tail surfaces. The fuselage shaping has produced a number of positive outcomes:

Compared to other F3F models, the fuselage of the 'Saker' is significantly larger. Among other things, this makes it easier to launch the model.

- Help to add strength to the fuselage in many of the areas I have seen bandaged up after trips to the Wrecker.
- Generate a keel that, in partnership with the high V tail has given the Saker excellent yaw stability.
- There is still enough room within the fuselage for a simple fit out and fuselage mounted ballast.

The first prototype 'Saker' was delivered in Summer 2022. Test flights with this first model, whilst identifying areas to improve were enough to entice John Philips to come on board with the Saker project. Talking with John learning about the Saker's set up has been a privilege and an education. John has dedicated a significant amount of time to the development process, both to understand the model but also feedback to the manufacturer and improve the physical model. Understanding the thought process behind changes in CG, snap flap and elevator settings is something that I have learnt from- despite the many years I have been flying- but this is for another article.

FACTS

The F3F model 'Saker'
A competition model by Ian Mason

Wingspan	3,000 mm
Length	1,400 mm
Weight	from 1,900 g
Wing area	58 dm²
Wing loading	from 32.8 g/dm²
Price	**approx. 1,050 euros**

Available from Hyperflight,
phone/WhatsApp: +44-7821/351341,
***www.**hyperflight.co.uk.*

The top three in the 2024 English Open: Graeme Mahoney (11,298.81), Mike Evans (11,298.81) and John Phillips (11,191.81).

John reported on his experiences: „I fly with the CG at 105 millimetres, but move it forward by one millimetre when I ballast the model. Without ballast, I fly with a weight of 2,700 grams. So far, I have only used a maximum of 750 grams of ballast. However, I could get 1,000 grams into the fuselage. Another 1,000 grams are possible if I use the steel connector for the wings. With a total weight of 4,500 grams, the model already flies very impressively.“

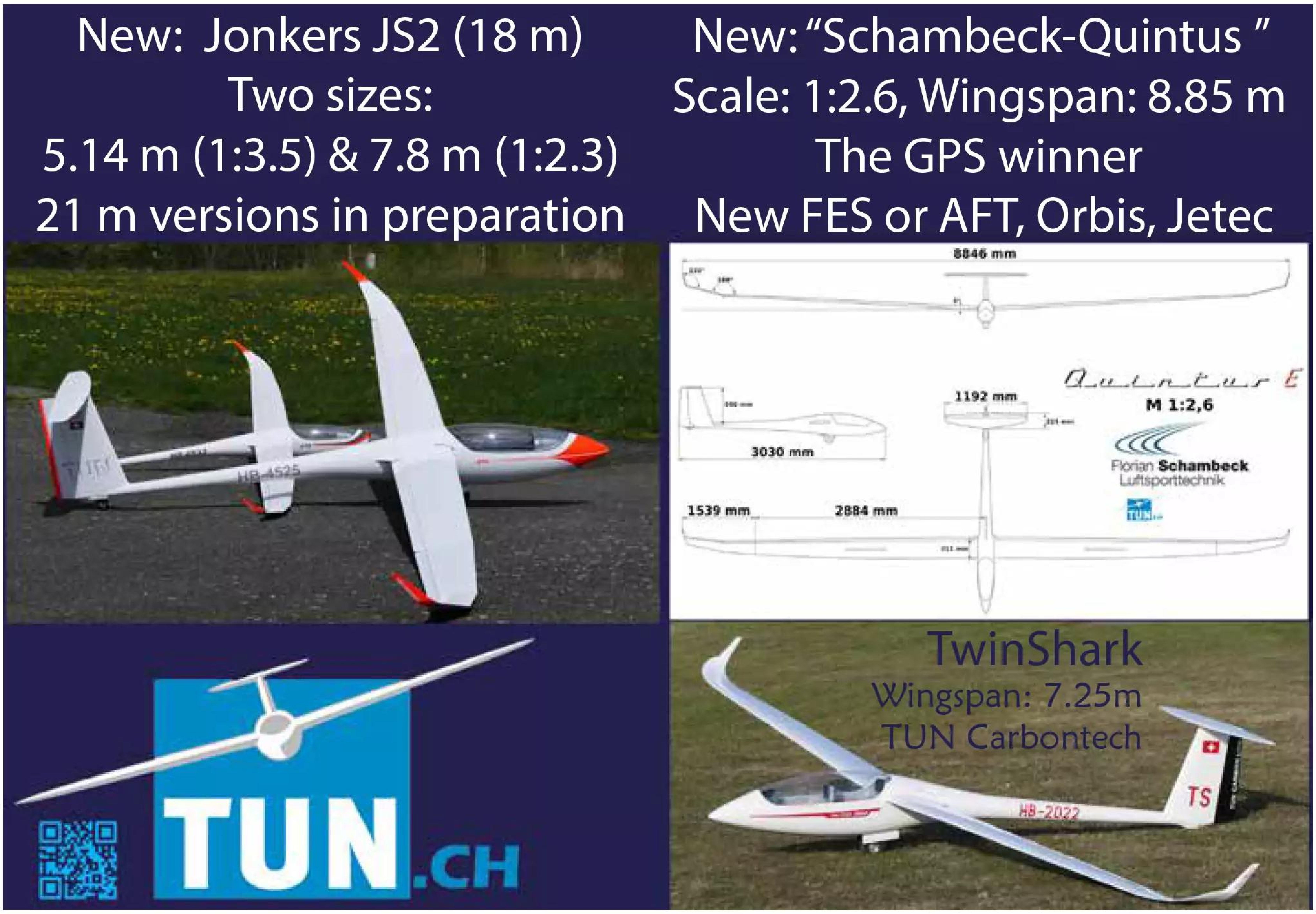
Although we do not all have the luxury of an open feedback channel to a manufacturer, learning and understanding a model by spending time on the sticks in different conditions is something that has definitely improved my own flying.

The original goal of managing to produce a 1,000 euro model to take on the 'big boys' feels like it has been achieved. No model can guarantee fast times and wins but the Saker is a model that I have enjoyed watching win round after round this year. ■

Ian Mason

Dieter Perlick (GER) flew the latest version of his 'Caldera' last season.

The ‘Mamba’ from Competition Tools was also successfully deployed in many places.



New: Jonkers JS2 (18 m)
Two sizes:
5.14 m (1:3.5) & 7.8 m (1:2.3)
21 m versions in preparation

New: “Schambeck-Quintus ”
Scale: 1:2.6, Wingspan: 8.85 m
The GPS winner
New FES or AFT, Orbis, Jetec

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Wingspan: 7.25m
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TUN.CH
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1192 mm
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2884 mm
Quintus E
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GLIDING

THE DOUBLE PAGE WITH NEWS FROM THE BIG NAMES

Aero 2025

760 exhibitors from 38 countries showcased a total of 328 aircraft at the Friedrichshafen exhibition centre on Lake Constance, ranging from drones and gliders to ultralight aircraft, single- and twin-engine touring aircraft, helicopters and long-haul jets. A total of 32,100 visitors travelled from more than 80 countries, 600 more than last year. Manufacturers of gliders traditionally attract a great deal of interest at Aero. This year's exhibitors included DG Aviation and Jonker Sailplanes, Schempp-Hirth and HPH Sailplanes. Aero also offers modellers a wealth of information and inspiration. Next year, Aero will take place from 22 to 25 April.

Editorial team

The new classic

Schempp Hirth announced at Aero that it will resume production of the 'Discus 2' in a modernised new edition. 'In 2026, we will bring the classic up to the latest state of the art in order to offer the perfect aircraft for clubs and all standard class pilots,' the company said in a statement. In particular, the aerodynamics will be revised and the aircraft will be equipped with modern features found in current gliders.

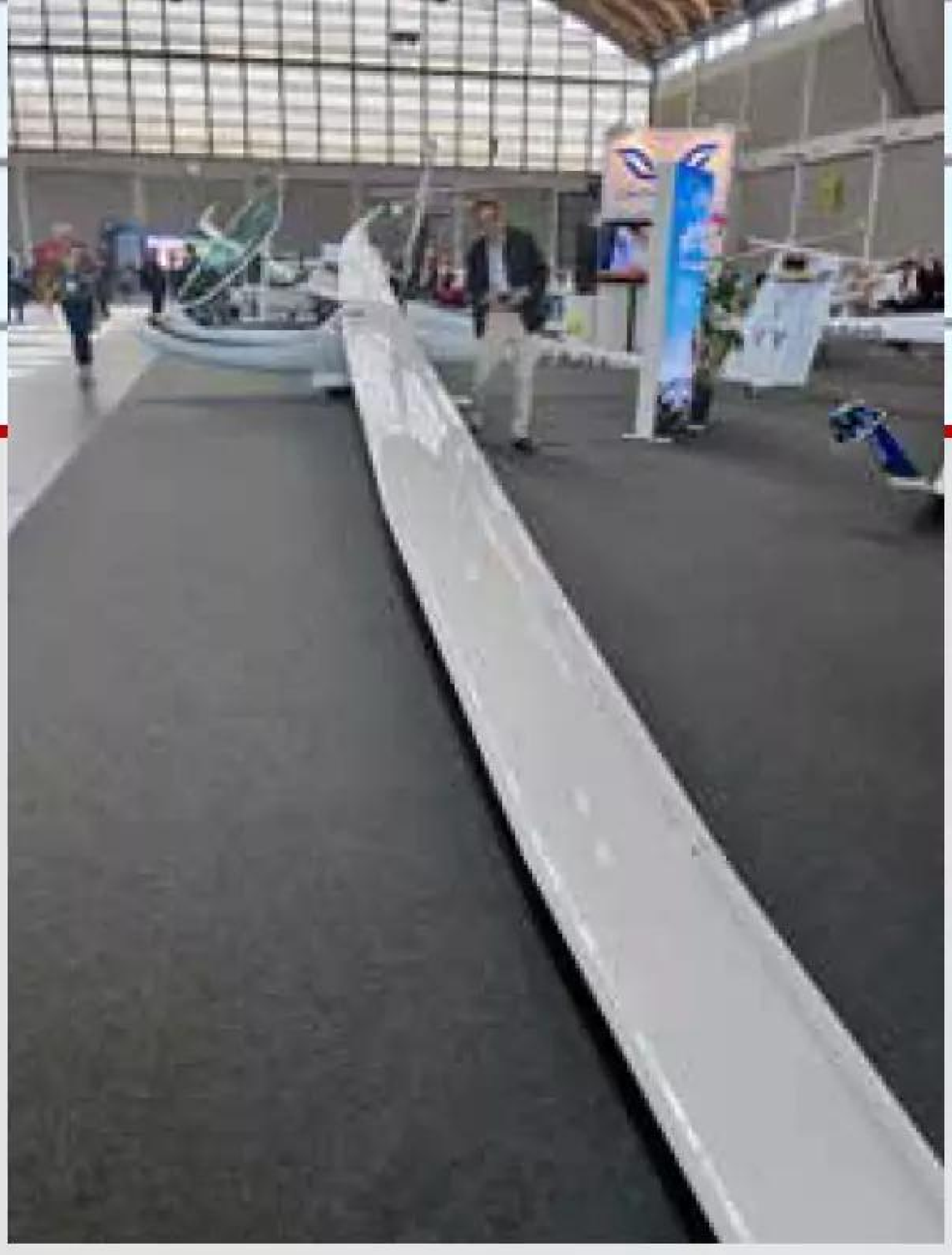
Editorial team

Discus-2
COMEBACK 2026
SCHEMPP-HIRTH

Electric self-launching

At Schempp-Hirth in Kirchheim/Teck, the 'Ventus E' with its electric folding engine attracted particular interest. More than 250 'Ventus 3' aircraft have been built since its maiden flight in 2016. It is one of Schempp-Hirth's most popular aircraft. With its electric engine, the 'Ventus E' is capable of self-launching and achieves a climb rate of 3.3 to 4.1 metres per second. It can reach an altitude of around 2,500 metres. The engine delivers around 39 kilowatts of power from two 400-volt batteries. The system weight of the entire drive train is around 77 kilograms.

Editorial team



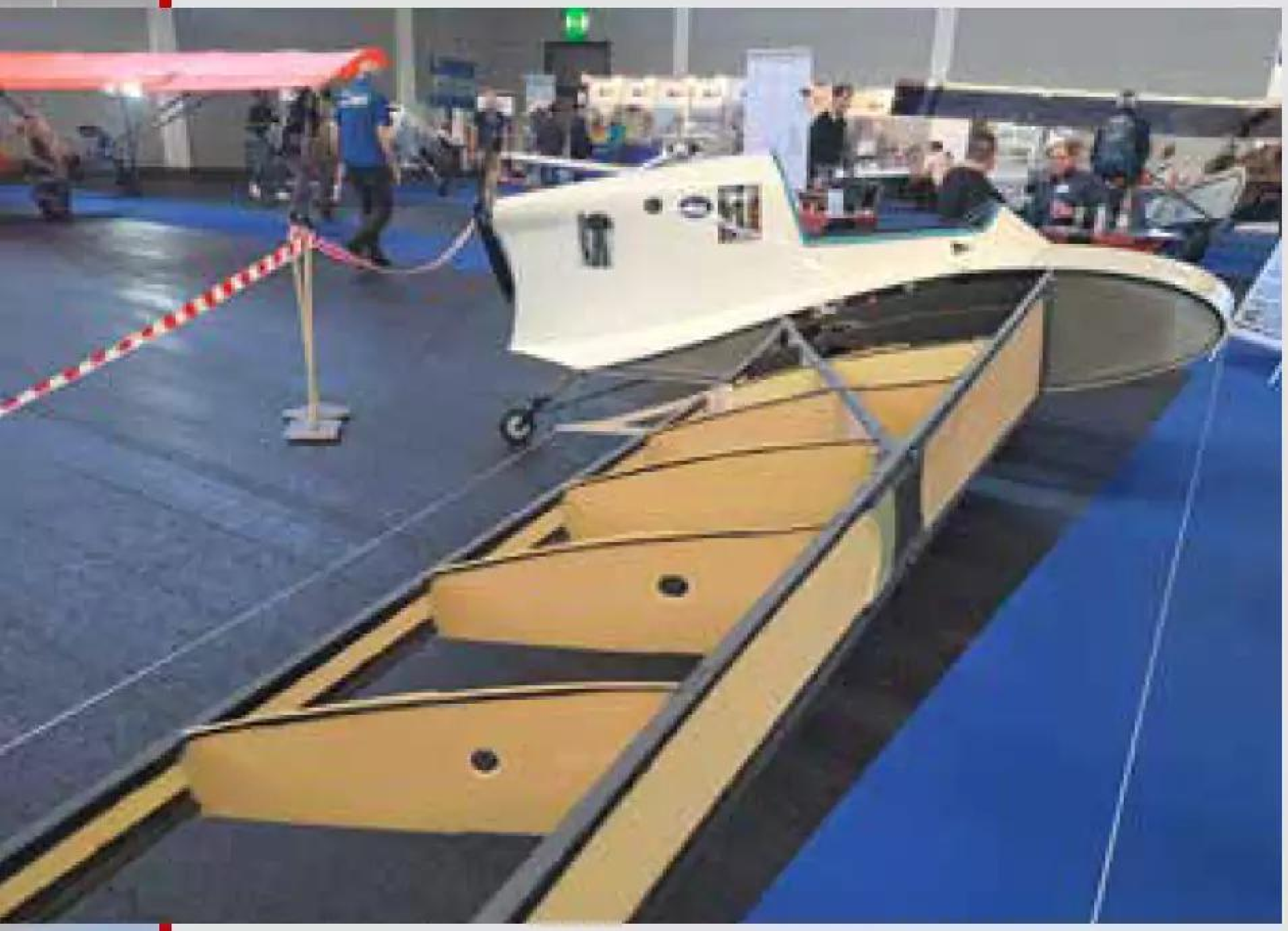
European premiere: 'JS-5 Rey'

Jonker Sailplanes from South Africa focused on the 'JS-5 Rey'. Ondrej Hanak had already presented his 1:2 model of the high-performance glider in AUFWIND 2/2025. The original flew for the first time in November 2023. The open-class competition glider has a wingspan of 24.2 metres, a maximum take-off weight of 770 kilograms and a glide ratio of 44. The development of this impressive glider builds on its predecessors. The fuselage is based on the 'JS-2', and the newly developed wing with its large wingspan has the multiple swept-back layout typical of all Jonker gliders. Following the trade fair, on 15 April, the 'JS-5 Rey' took off from European ground for the first time.

Editorial team

Flying wing project

With 'Schneewittchen SW-I', Dr Andrés Chavarria Krauser and Dr Maja Christ are realising an ambitious flying wing project based on the Horten principle (www.hortenmicrolight.wordpress.com) in Stuttgart. With a wingspan of 12.5 metres, the target empty weight is 120 kilograms. The planned cruising speed is 90 to 120 kilometres per hour. The flying wing will be powered by a 22 hp petrol engine. The two aircraft designers did not want to commit to a date for the maiden flight during their interview at Aero. However, a 1:4 scale model was successfully test flown in 2013, confirming the design principle.

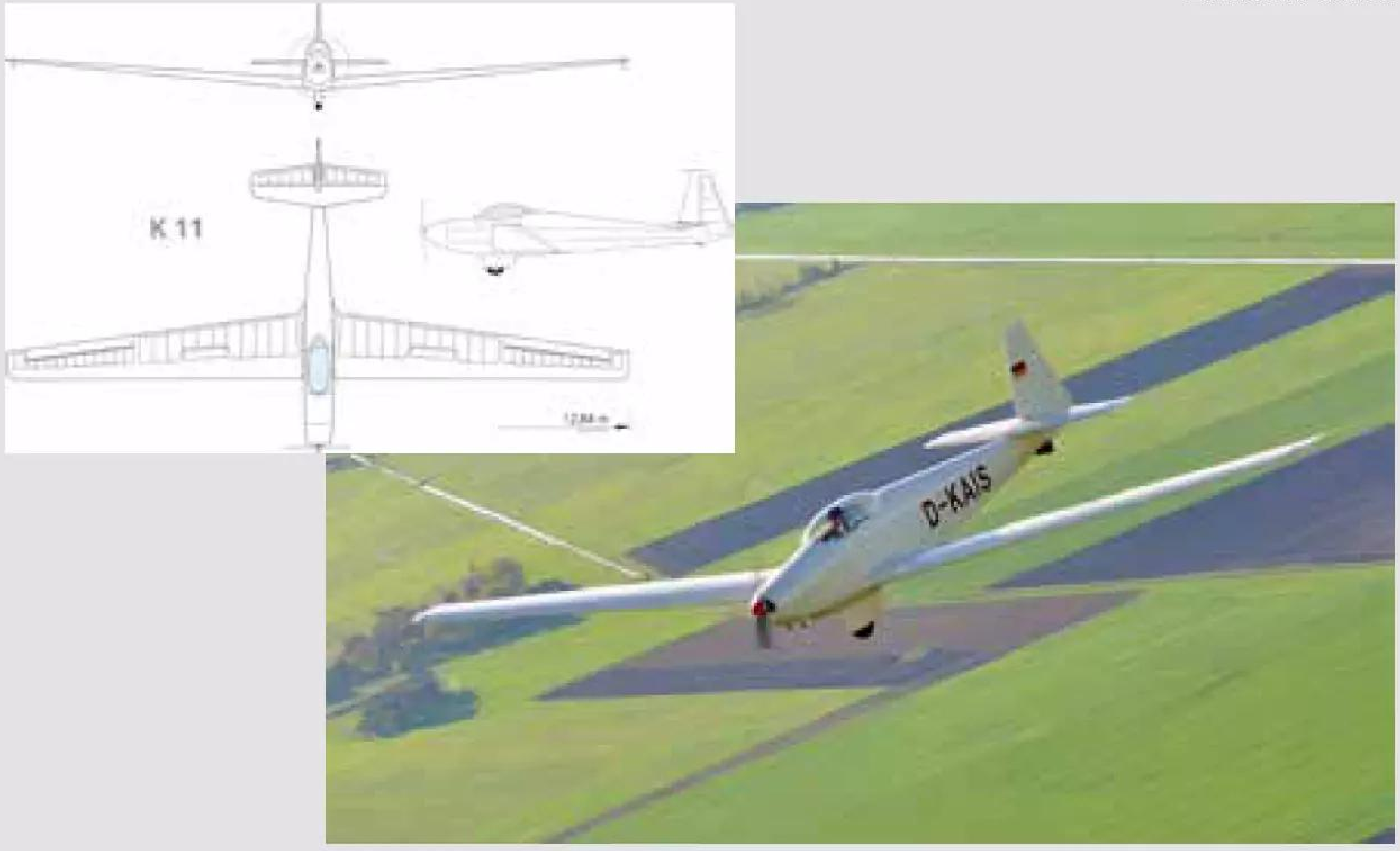


Editorial team

K11 back in the air

At the end of April, the Quax Flieger team (www.quax-flieger.de) flew the world's only remaining 'K11' again. The aircraft was built in 1964 by Rudolf Kaiser as a one-off. The motor glider has a wingspan of 12.8 metres and weighs around 200 kilograms when empty. The 'K11' is powered by a two-cylinder engine with only 25 hp.

Editorial team



'DG-800': conversion to electric

Bei DG-Aviation war zu erfahren, dass DG Aviation has announced that a folding engine with electric drive will be offered as a conversion kit for the 'DG-800A', among other models. The same system has already proven itself in the 'JS-3 RES'. It consists of an 'Emrax 208' motor and two 'Emectric BM384' batteries with an output of 40 kilowatts. This enables climb flights of up to four metres per second after take-off and a total altitude of 1,700 metres on a single battery charge. The weight of the entire system, including the battery, is comparable to that of the previous petrol engine system with a full tank,' emphasises company spokesman Jonas Kühn.

Editorial team

DG Aviation

FROM HLG TO F3K SPORT

THE HISTORY OF F3K MODEL FLYING IS FULL OF HIGHLIGHTS

From 27 July to 2 August, the F3K World Championships will take place in Tarp, Schleswig-Holstein. AUFWIND magazine has been closely involved in the development of modern F3K model flying. Alexander Wunschheim has been there from the very beginning. He played a key role in developing the class, and Philipp Gardemin spoke to him about his experiences.

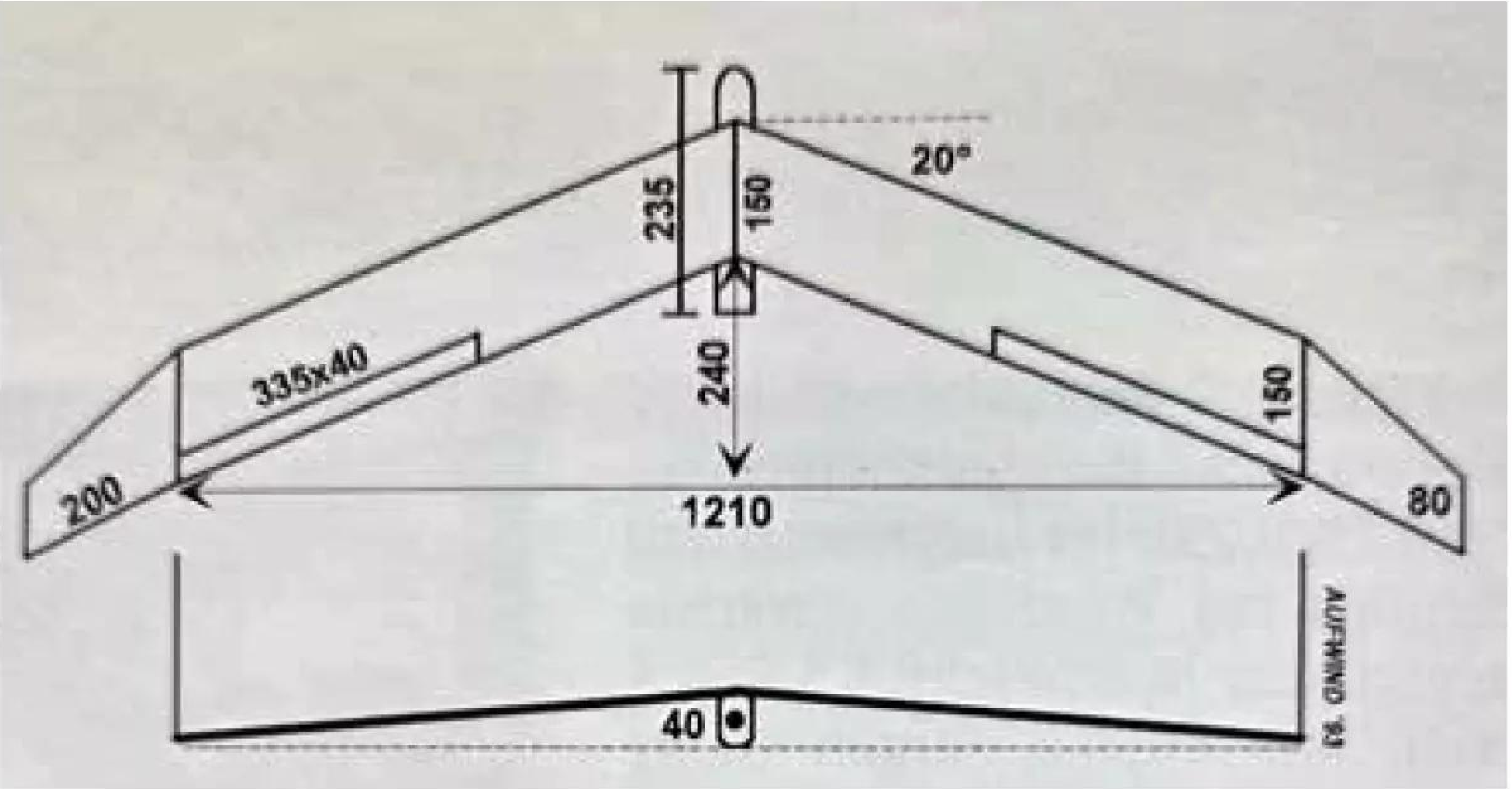
Model aircraft enthusiasts have always launched small and larger glider models by hand. On slopes, of course, but also on flat ground, where first flights were prepared with tentative hand launches. Many experienced that the model did not really want to land. The first full circles were flown. Sometimes a second or even a third full circle was added. Thermals near the ground? This thrilled many model aircraft enthusiasts.

In the summer of 1989, Kai Erdmann launched the AUFWIND magazine. From the very beginning, there were reports about small wooden gliders with ribbed wings. Kai Erdmann heard about these hand-launch gliders

Walther Bednarz (far right) suggested meeting with F3K veteran Alexander Wunschheim to talk about the history of F3K.

F3K is sport. Here is a photo of the Brezn' Cup in Munich in 2024.

The ‘Tercel’, imported from the USA to Europe by Stefan Höllein, laid the foundation for the widespread popularity of HLG sport.



The flying wing played a role in the development of HLG models from the very beginning, but never really caught on. Here is a study from 1993 by Hartmut Siegmann.

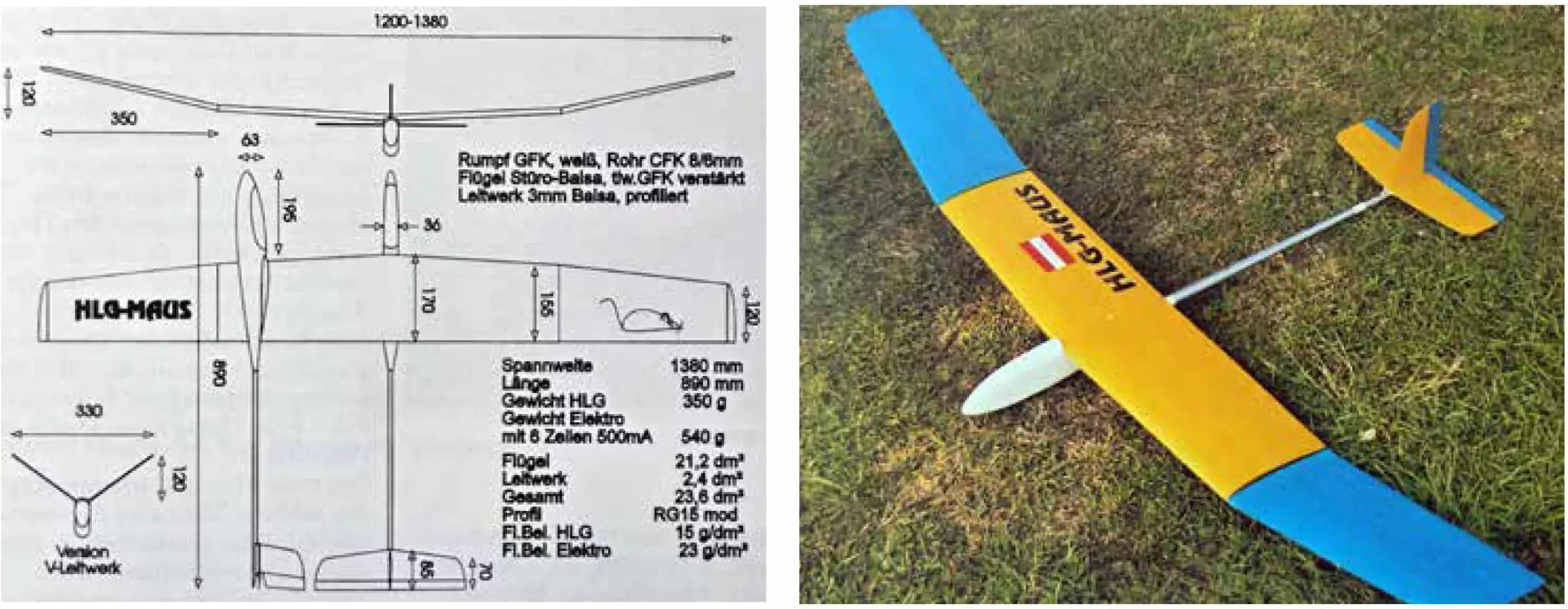
(HLG for short) from friends in the USA. Here, model aircraft enthusiasts launched models with wingspans of 100 to 150 centimetres in large supermarket car parks using a javelin technique and were able to complete thermal flights. Then Stefan Höllein came into the picture, who was already running his first small shop in Coburg at the time. Kai Erdmann called him and told him about the American HLG pilots. Stefan Höllein immediately recognised the emerging trend and imported the first HLG model kits to Germany with the ‘Tercel’ models. Kai Erdmann invited people to the first HLG meetings in North-Germany early on and organised the first small competitions.

Media entrepreneur Horst Kropka from the Allgäu region (Bavaria) was also involved from the early days. A few years later, he took over Kai Erdmann‘s AUFWIND magazine and continued to run it until his death in March 2024. One of his companions was Alexander Wunschheim from Munich. “In 1992, we organised what was probably the first large-scale HLG competition near Munich with the so-called Schmeißgeier Cup,” he says. The enthusiastic thermal flyer and free flight enthusiast discovered his passion for HLG models early on and found them to be the ideal combination of free flight and remote-controlled thermal flying. He had already been flying in the RC-4 gliding class with rubber or winch launches, a maximum flight time of 200 seconds and target landing.

With the ‘Tercel’ imported from the USA, the still young HLG model sport scene got its first series model. Launches were made in a javelin-style manner at heights of around 20 metres. Around 25 participants came to Munich for the competition in 1992. Many Austrians led by Werner Stark and Wolfgang Zach took part and showed that a parallel development of the HLG scene was taking place in Austria. The competition was won by its initiator, Alexander Wunschheim, with his self-built model ‘Time Machine’. The design incorporated numerous influences from the free flight scene.

The models of the participants in Munich all had a wingspan of 150 centimetres, flew with weights of around 280 grams and were controlled with rudder and elevator only. “A later innovation for better launch heights was the grip hole in the fuselage floor under the wing‘s trailing edge,” recalls Alexander Wunschheim, explaining: “This allowed us to give the model significantly more thrust with the index finger of the throwing hand. Launch heights of up to 25 metres were achieved with this technique. However, in order to have reasonably comparable starting heights in difficult conditions, rubber cord launches were occasionally allowed, an idea from Austria.”

After the competitions, pilots from Austria and Germany got together and developed the idea and the rules further. Among them were Alexander Wunschheim, Wolfgang Zach, Werner Stark and Karl Hinsch. The latter wrote the first evaluation programme with group assignment for competition evaluation in 1996. “The rules in Germany were consolidated and were used in almost all competitions at that time,” says Alexander Wunschheim. “The drafts were sent to the FAI Aeromodelling Commission (CIAM), which then turned everything into a



Rumpf GFK, weiß, Rohr CFK 8/6mm
Flügel Stüro-Balsa, tw.GFK verstärkt
Leitwerk 3mm Balsa, profiliert

Spannweite	1380 mm
Länge	890 mm
Gewicht HLG	350 g
Gewicht Elektro mit 6 Zellen 500mA	540 g
Flügel	21,2 dm²
Leitwerk	2,4 dm²
Gesamt	23,6 dm²
Profil	RG15 mod
Fl.Bel. HLG	15 g/dm²
Fl.Bel. Elektro	23 g/dm²

Wingspans of up to 150 cm and control via ailerons and elevators were the cornerstones of designs at that time. Here is the ‘HLG-Maus’ model by Peter Schönmann from Austria in 1994.

REPORTAGE

HLG „Deutschland-Cup `94"
in Kulmbach

AUFWIND has contributed significantly to the development of F3K model flying with its comprehensive reporting.

provisional set of rules for the competition class that was introduced in 2001 under F3K. Over the next few years, these rules were developed further."

In 1992/1993, Horst Kropka founded the competition platform Contest Modellsport. His aim was to promote the professionalisation of the competition scene in as many model sport classes as possible. Initially specialising in F3B and F3J, Contest Modellsport also took over the promotion of the still young HLG competition scene in 1996. The AUFWIND magazine served as the leading news channel. The F3K competitions in the Allgäu region, organised by a team of active F3K pilots led by Horst Kropka, were also well attended during those years. The HLG class gained its first lobby in the German Aeroclub's RC Flight Committee, with Alexander Wunschheim as its first technical advisor, and thus also the right to an open international German championship. From 2007 F3K was declared an official competition class by the FAI.

The 'Wurfmäusle' by Claus Schnarrenberger is considered the first HLG model with a full-core wing and GRP coating.

In the summer of 2000, the first international German championship in the F3K class took place near Munich. Not only were models with ailerons successfully used here, but a new launching technique also dominated the competition: "In May 1999, I flew with some colleagues from Switzerland and Austria to the USA for the international HLG competition in Poway (California). This trip was to fundamentally change our view of the HLG scene," recalls Alexander Wunschheim. Not only was it the largest HLG competition in the world at the time, but for the first time, Europeans were introduced to the completely new launching technique developed by Dick Barker from Seattle. He held his model at the edge of the wing and hurled it into the air with a semi-circular movement. At that time, he did not yet use the now obligatory throwing stick, which makes the connection between the hand and the model much more stable and secure. "We were all amazed, and our internal discussions were intense. For us, it was the first attempt at the discus launch, which later became the DLG," Alexander Wunschheim continues. A few months later, the first models for catapult launch appeared at competitions in Europe. "There were a lot of breakages because we had initially built fuselages without any CFRP tubes," Alexander Wunschheim recalls with a smile. This was because CFRP tubes with sufficient strength were not available.

The 2000 German Championships in Munich are still considered a turning point in the F3K scene: three-axis controlled models flew here with weights ranging from 270 to 320 grams, and the proportion of models with GRP fuselages and foam core wings increased significantly. However, in his report in AUFWIND 6/2000, Alexander Wunschheim also pointed out the significant differences in launch techniques: "The new technique is gentler overall and therefore also suitable for older HLG pilots. With the javelin throw method used previously, there were significant differences in altitude between the top pilots on the scene and between young and older pilots. Many training take-offs for the SAL technique are fundamentally important." Ralph Mittelbach (GER) won the German Championship ahead of Wolfgang Zach (AUT) and Jens Kleinert (GER).

From the very beginning, the diversity of the HLG and F3K scene was brought to life by innovative model aircraft enthusiasts. In addition to the first kit models, countless pilots took part in the competitions with their own designs. Flying wings were also repeatedly brought to the start line. However, they never caught on and with the advent of the DLG start, they disappeared from the scene altogether. Experiments were also carried out early on with Styrofoam wings. In the mid-1990s, Claus Schnarrenberger from Göppingen (Stuttgart-region, Germany) offered one of the first series models in full GRP construction with foam cores in the wings and tail units, the 'Wurfmäusle'. Initially built for the classic HLG launch method, the 'SiSAL' was his first model for catapult launch. The maximum wingspan of 1.5 metres was laid down in the regulations and hardly any designers went for a smaller wingspan.

highlight

Neue HLG-Wurftechnik

AUFWIND 5/2000: The launch technique was also presented in Germany for the first time.

The year 2001 was considered the year in which HLG finally became F3K. Alexander Wunschheim recalls: “Our US-colleagues were already flying their HLG models with ailerons and flaps. Our models were still sailing through the air with rudders.” So the next necessary step in Europe was to allow ailerons in the regulations and thus also to use four servos in the model. However, the sizes available at the time imposed some limitations on the project. But the models were also redesigned with increasingly thinner and more powerful profiles and new wing geometries. Modern construction methods using full GRP/CFRP did the rest. “F3K models developed more and faster than ever before into genuine high-performance sports equipment with aerodynamically perfect designs,” says Alexander Wunschheim, who retired from active competition in 2011.

He is considered the father of the HLG launch: Dick Barker at the IHLGF in Poway in 1999.

Florian Seibel flew the ‘Kolibri’, the result of his diploma thesis, at the German Championships in Kaltenkirchen in 2004.

F3K models now became a serious model sport class, even for suppliers and manufacturers. Stefan Eder (Aer-O-Tec), for example, launched one of the first F3K competition models in series production with the ‘Gypsy-5’. “It was one of the first full GRP models in the still young HLG scene,” he later reported in an interview with Philipp Gardemin. TUD then introduced the ‘SALpeter’ and ‘Aspirin’ models. The Logo team developed the ‘Steigeisen’ model. Manufacturers from Eastern Europe also had a major influence on the global F3K scene.

But there were also in-house developments. At the 2004 German Championships in Kaltenkirchen, for example, Florian Seibel presented a very remarkable study called the ‘Kolibri’ (hummingbird). The model was developed in collaboration with the Logo team, was the subject of a diploma thesis and was intended to prove the theoretically developed parameters in practice. Florian Seibel was initially concerned with the theoretical recording of all parameters that have a positive or negative influence on the release (pendulum movement) and the subsequent climb. Using a computer simulation, various configurations were then tested for, among other things, wing geometry, tailplane arms, levers, sweep and V-shape. The theoretically calculated pendulum angles that occur during take-off were then recorded with a high-speed video camera. These could also all be confirmed.

The offer from CFRP fabrics has given the production of high-performance F3K models another huge boost. The ‘Carboline’ lay-up by Vladimir Gavrilko from Ukraine deserves special mention here, especially with its foam core. The high-performance DLG ‘CX-5’ is one of the most popular examples of this design. Roland Sommer surprised everyone back in 2009 with the first ‘Concept’ DLG in the F3K scene. In 2011, the exceptional American pilot Joe Wurts flew the ‘CX-2’ at the F3K World Championships in Sweden and became world champion. In 2013, the ‘CX-4’ was already being flown at the World Championships in Denmark. Four years later, Dutchman Vincent Merlijn became F3K world champion in Ukraine with the ‘CX-5’. The CX-6, which is being used for the first time this season, is considered by experts to be the provisional highlight in F3K model development.

Today, F3K model flying is an internationally flown competition class with an above-average number of young pilots compared to other model flying classes. Numerous manufacturers offer models and actively support the sport. “We have reached the limits of what is currently possible in model aircraft construction and have arrived at a point where the pilot alone determines the maximum flight performance of his model,”’ summarises Roland Sommer. Weights of 210 to 250 grams are flown. Although ... variable geometries and wingspans depending on the flight task would be something that could still come ... we will see what the future brings. ■

Philipp Gardemin

F3K World Championship

From 26 July to 2 August, the world‘s elite F3K model aircraft pilots will gather in Tarp in Schleswig-Holstein, approximately 139 kilometres north of Hamburg Airport. Event manager Sebastian Brandes expects a high level of international participation. More than 20 teams with over 100 pilots are expected, including numerous youngsters.

www.f3k2025.fun

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The glider pilot's paradise in Spain. Take part in various events at the MFR

Foto: Freepik, jplenio1

INNOVATION FROM FRANCE

GLIDER MODELS WITH A PERSONAL TOUCH

GRP fuselages and wings in conventional Styro/Abachi construction are making a comeback. MCM in France is considered a pioneer of this rediscovered construction method. Markus Thewes spoke with company boss Stéphane Boulanger.

A look back at the 2023 Segelflugmesse in Germany: The French supplier MCM presented a range of conventionally manufactured glider models with GRP fuselage and Styro/Abachi wings in Germany for the first time. MCM is a household name for model aircraft enthusiasts in France. Since company founder Michel Clavier handed over the reins, the three letters MCM now stand for Matériaux Composites et Modélisme (composite materials and model making).

MCM was founded in 1993 and is considered the oldest manufacturer of model aircraft in France. The 'Crystal' in 1:3 scale, built on the model of the original with a wingspan of 15 metres by French manufacturer Stralpes Aéro in 1986, was the first remote-controlled series model with a wingspan of five metres. By 1995, MCM had already specialised in electric motor glider models, and over 100 units of the 'Cumulus' with a wingspan of 3.7 metres were produced – an impressive number for a small-series manufacturer at the time. In 1998, as part of a cooperation with the Swiss aircraft manufacturer Pilatus Aircraft in Stans, the 'Pilatus PC-6 Turbo Porter' was added to the range as a motorised model with two wingspans of 2.7 and 1.7 metres. However, the focus was to remain on glider models, and so a 3-metre version of the 'Crystal' and the 'Orcal' were added in 2001. This was followed in 2003 by the 'ASW 22' with a wingspan of 7.5 metres, which is still in production today and was considered the largest series-produced model glider at the time. In 2006, the range was expanded to include a 'Stemme S10' with integrated electric drive and, in 2008, a 'Diana' with a wingspan of 2.8 metres.

When Michel Clavier was looking for a successor in 2019, Stéphane Boulanger, then 32, came into the picture. Born and raised in Saint-Quentin in Northern France, he encountered flying at an early age. He spent many weekends with his father at the gliding airfield with manned aircraft. However, after the fatal accident of a fellow pilot, Stéphane turned his attention away from manned aviation and towards model

Gliding Fair 2024: Stéphane Boulanger (far right) and his team are exhibiting in Schwabmünchen for the second time.

AT A GLANCE

MCM – Matériaux Composites & Modélisme
Sordet
42410 Pelussin
France
Phone: +33-6/33083242
Email: mcmod42@gmail.com
www.mcmod.fr

Flying large model gliders in alpine conditions is Stéphane Boulanger's great passion.

flying. At first, model flying was only a sideline for him, as all his passion was devoted to canoe and kayak marathons. This led him to study sports in Lille and then to the National Institute for Competitive Sports in Paris. He stood on the podium at world and European championships on several occasions. It was only when Stéphane was unable to train for canoeing in 2008 due to a broken wrist that he took up model flying. He learned model flying on a Multiplex 'Fiesta' that he bought second-hand. Later, he and his father built an 'ASG 29' with a wingspan of five metres. In 2019, he came across an advertisement by Michel Clavier, who was looking for a successor, and saw this as an opportunity to combine his passion for model gliding with his desire for professional independence. Michel Clavier also took a liking to the ambitious model aircraft enthusiast and handed over his company to Stéphane Boulanger.

A success for everyone!

Exhibitors and visitors at ProWing 2025 were able to gain a wide range of insights into all aspects of model aircraft sports.

We would like to thank you once again for the positive suggestions. We will implement them at ProWing 2026.

We look forward to the next ProWing on April 24th–26th 2026, in Bad Sassendorf.

Werner Lewandowski - Andreas Engel - Peter Ritters

ProWing International Organizing Team

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Stéphane immediately recognised that in order to be competitive in today's market, he would have to update the production processes and designs. The first step was to redesign the wings of the large models, such as the 'LAK-17' and the 'ASW-22', using modern construction methods and materials, and to eliminate known weak points. In addition, the production of all models was converted to CAD designs. This means that the wing parts can now be cut with CNC control, resulting in much greater profile accuracy and quality. Modern 3D printing processes are also used to manufacture templates, installation jigs and other parts of the kits. Stéphane produces around 35 models per year, 95 per cent of which are made in-house. Only the canopy and frame, as well as the landing gear, are purchased from renowned German manufacturers. As a one-man operation, he occasionally enlists the help of his father and friends Michel and Olivier, who assist him with production and CNC cutting.

But it's not just in the workshop that he receives active support; he also gets help at meetings on the French slopes and at events such as the gliding fair, without which it would be impossible to operate as a small manufacturer, reports Stéphane: "We work together there, but we also enjoy the atmosphere of the fair and the direct exchange with people who are interested in our models, because there are no such events in France." One of the first people to help out was 19-year-old Valentin Fernandez. The two met at a gathering in France, where Valentin impressed Stéphane as a pilot and as a person. He immediately agreed to support MCM at the gliding exhibition in Schwabmünchen in Germany when Stéphane asked him. 'It has always been a dream of mine to be in Schwabmünchen,' recalls Valentin. 'Being able to fly Stéphane's glider models is always a pleasure and an honour.'

Production takes place in a small workshop. The entrepreneur is currently looking for larger premises.

Father and son Arnaud and Nicolas Cunnac then joined the planning for the second appearance at the gliding exhibition. Nicolas was a sports friend and Arnaud was Graupner's sales manager in France some time ago. Both have been nationally active model flyers and club presidents for years and organised the FXFC (French Xtreme Flight Championship) in Lyon, where the world's elite freestyle pilots met. With Bruno Tchatalian, a long-time companion of Michel Clavier and co-organiser of the flying group around the Banne d'Ordanche hang gliding site (AUFWIND reported in issue 5/2024), who knows MCM's products inside out and also speaks fluent German, the team for the gliding show was complete.

Today, Stéphane sells his models almost worldwide. Around 20 percent of the kits go to model aircraft enthusiasts in neighbouring European countries such as Italy, Spain, Luxembourg, Belgium, Germany and Switzerland, but also to the USA and Mexico. Nevertheless, Stéphane has no major expansion plans for the near future. "At the moment, I want to remain a small manufacturer. First, I need to establish my business permanently," he explains his plans for the future. 'With the upcoming models, one of which is also made entirely of composite materials, it would be a nice development to continue growing in the medium term. But to do that, I'll need larger production facilities and more CNC machines.'

He already has ideas for new models, but there is always very little time for development between producing the current orders. Stéphane doesn't want delivery times to be too long either. The current range is to be expanded and modernised with further glider models in conventional Styro-Abachi construction. Stéphane is also considering adding optional full GRP wings to the existing kits: "This would allow me to appeal to a larger customer base, because we all have our own preferences and personal budgets. From my point of view as a designer, I don't want to tell anyone what is better or worse."

Today, the existing models, most of which were designed by Michel Clavier, are gradually being replaced by new, more modern designs. However, some are also being further developed, for example with new profiles, fundamentally revised and given a completely new design with a new structure. Starting with the current 'JS3' with a wingspan of 5.14 metres (scale: 1:3.5), the model has been further developed and improved in all respects based on an existing fuselage. The next project is to be developed from scratch with Lou Rollin, a French designer who, for example, developed the F3F competition model 'Graphèn' and also produces it himself. 'With his knowledge of aerodynamics, design and composite materials, MCM will take the next step in development,' adds Stéphane.

Despite all these changes, Stéphane always keeps one thing firmly in mind: his love of true-to-life flying. ■

Markus Thewes

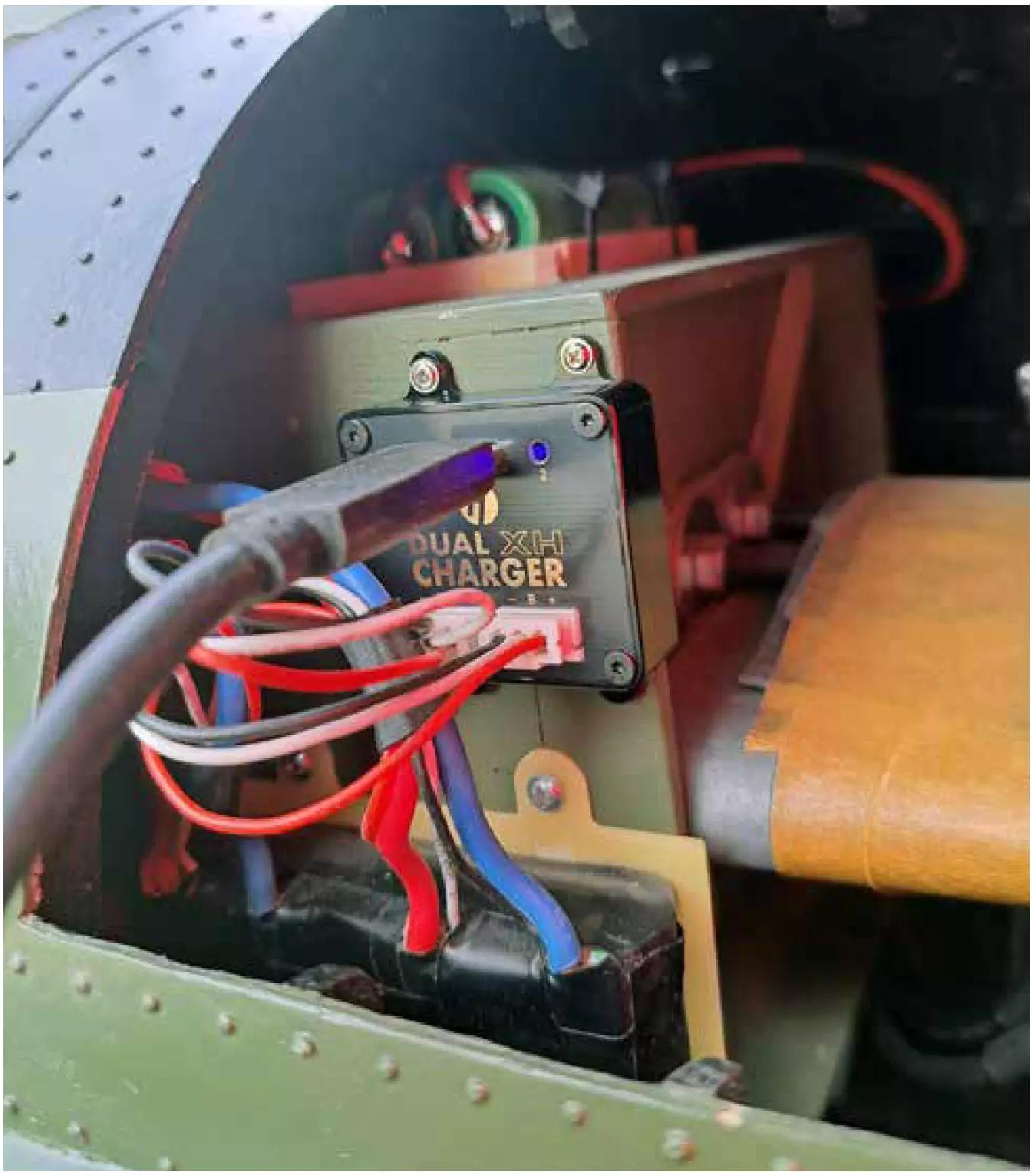
The focus is on craftsmanship, with all fuselages being laminated in-house.

Styrofoam wings covered with abachi and foil are the trademark of MCM.

PRODUCT-SPECIAL

EASY CHARGING

THE ‘DUAL CHARGER’ CHARGER FROM HACKER



The two receiver batteries in the Antonov AN-2 can now be conveniently charged without having to do any finger acrobatics.

Sometimes it‘s the little things that make life easier for model aircraft builders. This includes the new mini charger from Hacker. Philipp Gardemin has it in use.

In large glider and motorised aircraft models, a dual power supply with two 2s LiPo or Lion batteries has long been standard. However, depending on whether and how the batteries remain in the model, charging and balancing them can be quite a hassle. In addition, the charger with appropriately long cables is not easy to connect to the model.

Hacker Motor has now developed an innovative solution to this problem in the form of the ‘Dual Charger’: the charger weighs just 19 grams and can be permanently installed in the model. The XH balancer plugs (‘Dual Charger XH’) or JR connection plugs (‘Dual Charger JR’) then remain permanently connected. The previously necessary and error-prone plugging and unplugging of the battery connection cables is now a thing of the past.

The ‘Dual Charger’ is simply powered via a USB-C cable, as is commonplace with any modern smartphone. A 220/230-volt plug-in power supply, as found on every smartphone, is then used as the power source. The ‘Dual Charger’ can even be powered by a large power bank or from a car. A blue LED indicates the charging process and switches off when the batteries are full. The batteries are charged and balanced separately. It switches off automatically when the charging voltage reaches 8.4 volts. Charging is carried out at a maximum of 1.2 amps per channel, with a maximum charging power of 15 watts. A power source with five volts and approximately three amps is recommended. The standby current of the ‘Dual Charger’ is specified as approximately 82 milliampere hours per year (!).

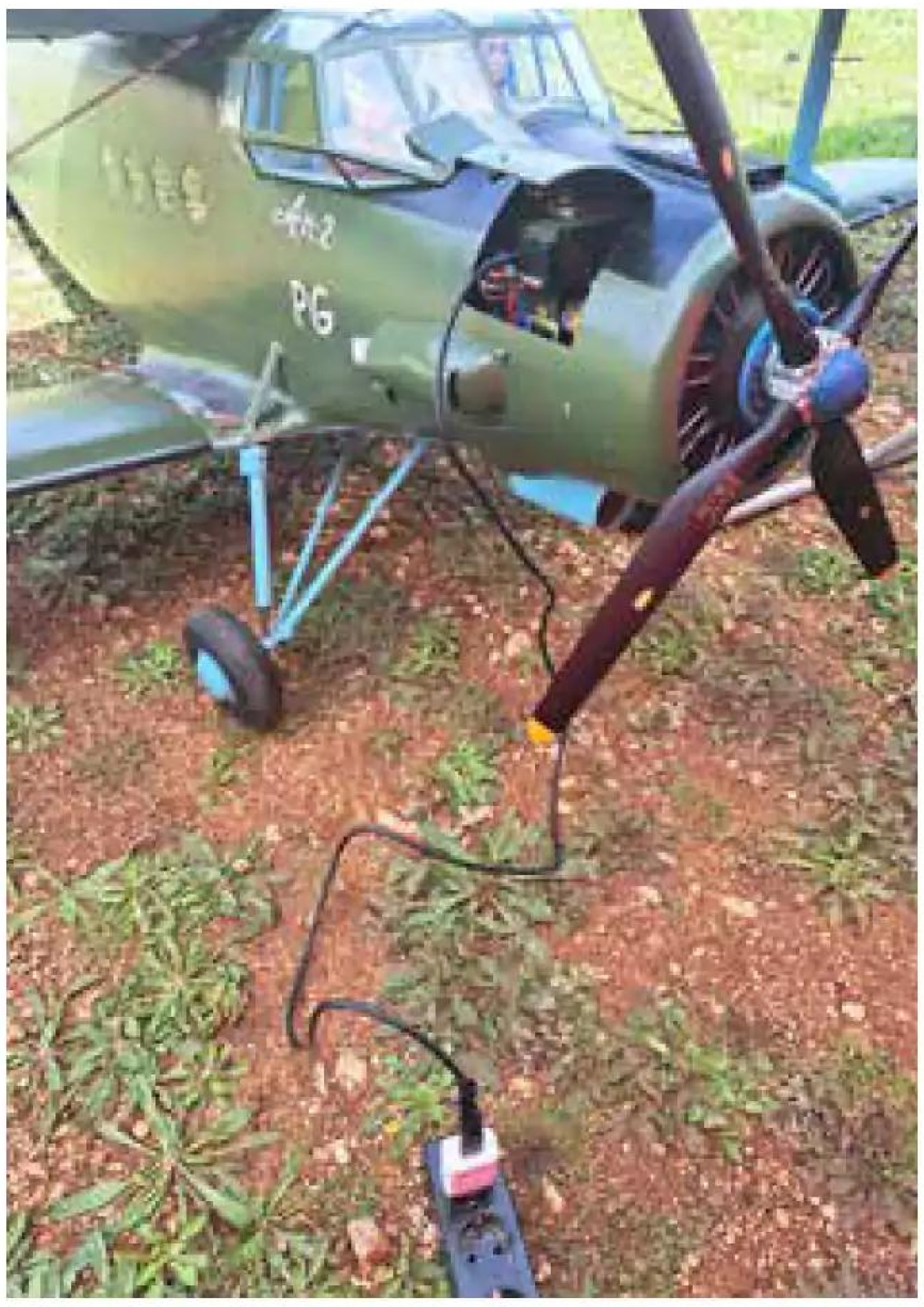
The small charger is attached to the model with four small screws, ideally so that the USB-C charging cable can be plugged in without any finger acrobatics.

The ‘Dual Charger’ costs 69.95 euros and is available from specialist retailers and Hacker-Motor (www.hacker-motor-shop.com). ■

Philipp Gardemin

DUAL XH
CHARGER
n-2
PG

The ‘Dual Charger’ measures 33 x 36 x 11 millimetres and weighs only 19 grams.



Charging is now very easy with a plug-in power supply and a USB-C cable.

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WEIGHT
FOR SPEED

MASTERING BALLAST IN F3F RACING

In F3F model flying, ballast is not just an optional extra, but a decisive factor in optimising the model's performance. Pierre Rondel is sharing his observations and experience and offers some useful tips.

Adding ballast is a double-edged sword: too much weight can make your glider sluggish in weak conditions, while too little can leave it unable to pierce through turbulence or maintain inertia in turns. The key is finding the right balance for each slope and wind condition. Let's provide you some insight about ballast strategy!

The topography of the slope often determines the location and quality of lift, which influences how much ballast you should use. On steep cliffs or Narrow Ridges, the lift zone is usually concentrated and close to the slope. These conditions often require precise flying, as moving too far out of the lift band can immediately reduce your energy. In these situations, use moderate ballast to maintain speed and stability within the narrow lift zone. Avoid over-ballasting, as the tight lift zone requires agility, and too much weight can hinder maneuverability. On Wide, Rounded Slopes with less defined ridges, the lift zone tends to be broader and further out from the slope. This allows for wider turns and longer flight paths. In these situations, heavier ballast is beneficial, as the broader lift zone gives the glider more room to gain speed without sharp corrections. A heavier glider can also help penetrate the potentially weaker lift further from the slope face.
Wind strength plays a vital role in how much ballast your glider can handle: In weak lift conditions (below 7-8 m/s), the primary goal is to keep your glider light and agile. Ballasting too heavily in these conditions will make the glider feel "sluggish," with slower acceleration and difficulty maintaining tight turns. Use little to no ballast to allow the glider to float on the weaker lift and minimize its sink rate and focus on clean, efficient turns, as every lost bit of energy is harder to recover. Moderate wind (8-12 m/s) provides stronger lift and more predictable conditions. Here, ballast becomes your friend, as a heavier glider maintains speed more effectively, especially when transitioning between turns. The plane is more stable in turbulence, helping to smooth out

After rain, the wind is often temporarily weaker, so the ballast must be reduced.

your flight path. Now, you can use a moderate ballast load to take advantage of the increased lift while maintaining responsiveness.

When the wind picks up above 12 m/s , the lift becomes powerful, and the airspeed of the glider can reach its maximum potential. This is when adding significant ballast becomes essential: A heavily ballasted glider punches through turbulence, reducing the effect of sudden gusts or lulls. Increased inertia ensures smooth, fast turns and helps the glider maintain momentum in straight sections. Use maximum allowable ballast, but ensure your setup can handle the stress, this is where fine-tuned gliders excel.

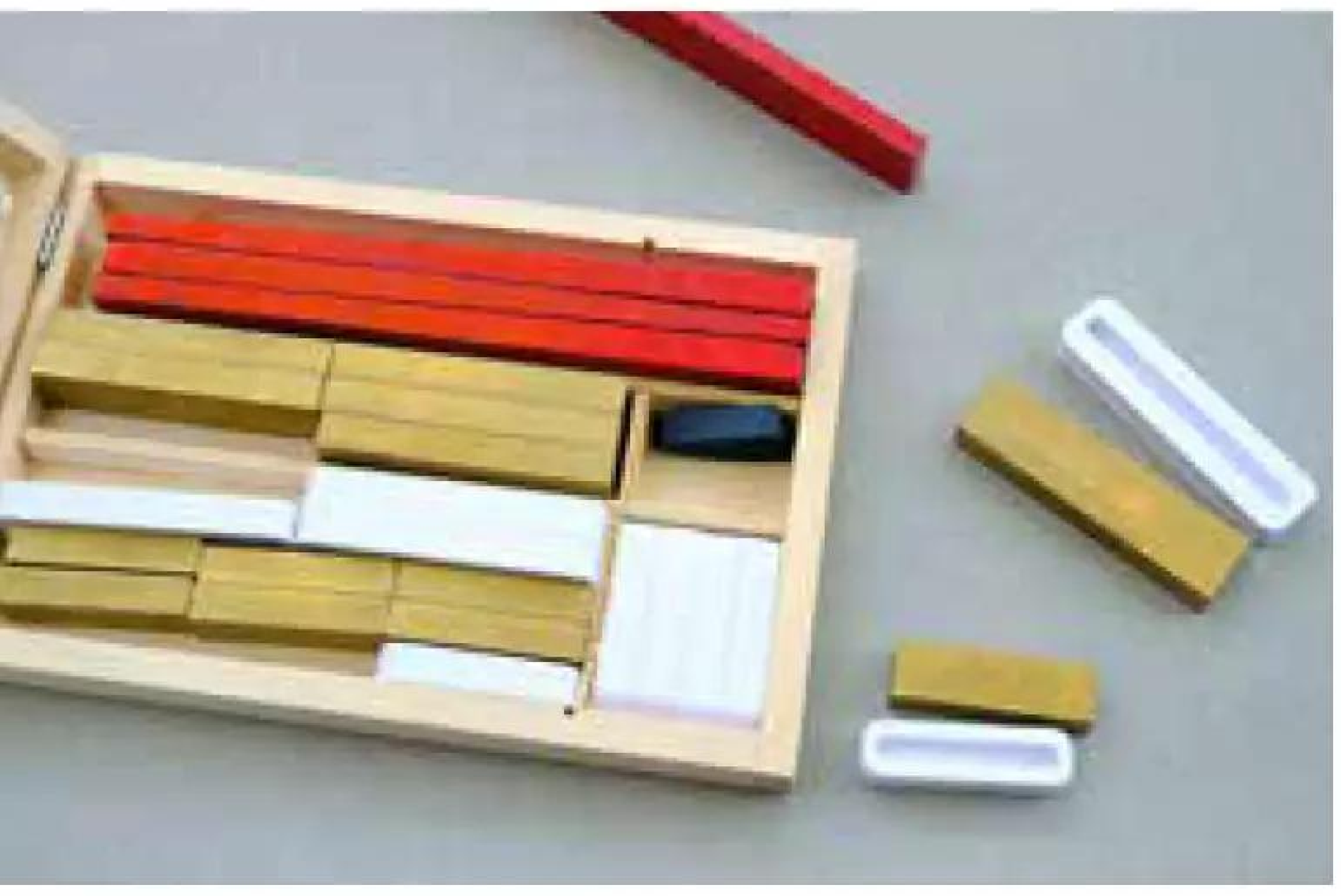
Wind and slope interact dynamically, and ballast strategy must account for this interplay: on steep cliff with strong wind, the lift is concentrated, so excessive ballast can still be counterproductive if your turns become too wide. Use enough ballast to stabilize the glider but retain the agility to exploit the tight lift band effectively. On broader slopes, moderate winds allow for wider, faster turns. Here, heavier ballast improves penetration into the wind and maintains momentum in the longer flight path. with weak wind on any slope, prioritize reducing weight to maximize float and minimize sink rate. Even on steep slopes, adding too much ballast can prevent the glider from properly climbing or accelerating.

No ballast strategy is set in stone. Experienced F3F pilots often adjust their ballast just before flying, based on real-time conditions. It is key to observe other pilots and top pilots and pay attention to how competitors' gliders are handling the conditions. Are they struggling in turns? Losing speed? If most are flying lightly ballasted, it might be a sign to do the same. If the wind fluctuates, consider being conservative with ballast too much weight can punish you during the run. Familiarity with the site often provides an edge. Knowing where the best lift zones are and how they shift with the wind will inform your ballast choice. Keep in mind that misjudging ballast can have a cost. When over-ballasting, glider loses efficiency in weak

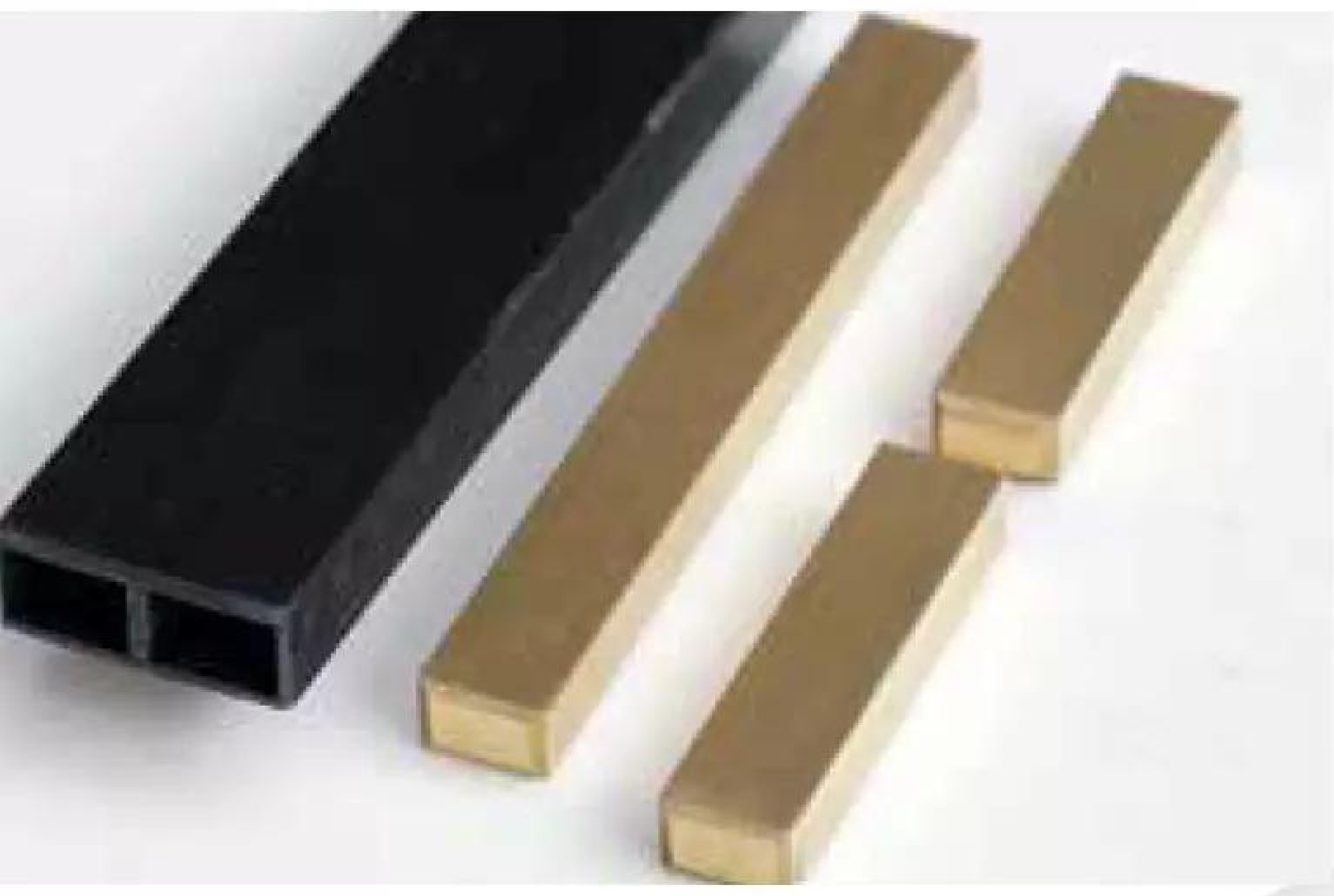
A small but very steep slope by the sea with very localised lift. Don't take too much ballast with you here.

On a cliff with a lot of wind, ballast quickly becomes your best friend!

The best ballast is the ballast that is directly on the centre of gravity.



A nice collection of lead and brass ballast and spacers.



Be careful, ballast in the wing joiner shifts the centre of gravity forward on most models.

conditions, turns widen, increasing the overall course time. And last but not least, the risk of damage during landing is real as the glider structure is heavily solicited. At the opposite, when under-ballasting, glider struggles to penetrate wind or turbulence, lacks the inertia needed for fast and efficient turns, and show slower straight-line speed and reduced overall performance.

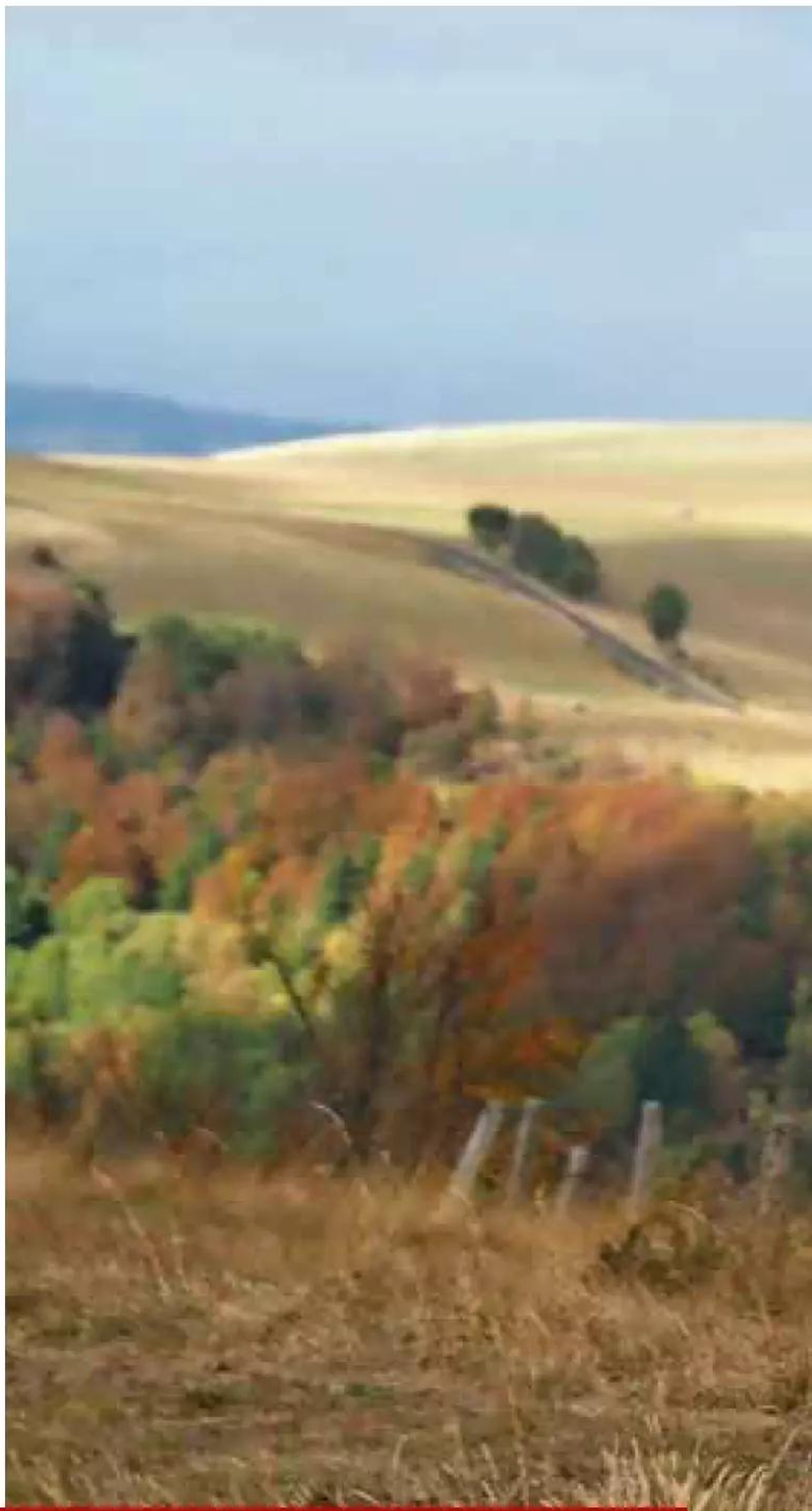
Where to start from? To give you a starting point, here is an approach you can follow to determine the amount of ballast to load. First, the wind speed is measured using an anemometer (only the total wind is considered here, without distinguishing between lift, horizontal wind, and crosswind). This will provide 90 per cent of the ballast value to be added to the glider, with the remaining 10 per cent accounted for by adjustment variables. Next, you need to determine the ideal weight of the glider in minimal conditions, i.e., with 3 m/s of wind. Then, you calculate the maximum ideal ballast that can be carried in very strong winds (23 to 25 m/s). It's possible that the ideal ballast exceeds the glider's ballast capacity in such conditions. Generally speaking, gliders around 2.75–2.85 meters should be able to carry between 1.5 to 2 kg more than their ideal weight at 3 m/s, and gliders around 3 meters should carry between 2 to 2.5 kg more.

Knowing the ideal flying weight of the glider at 3 m/s, you can follow this simple rule as a first approximation: For each additional m/s above 3 m/s, add approximately 100 grams of ballast. For example, if the wind speed is 6 m/s, you would add 300 grams to the ideal weight. If the empty weight of the glider is heavier than the ideal weight, no ballast is added until you reach the point where ballast should start being used.

On top of this first approximation, there is an adjustment to the ballast value based on the combination of slope topology and wind speed, as discussed earlier. These adjustment variables will result in a maximum difference of 200 to 300 grams more or less than the initial value. A deviation of 200 grams (more or less than the ideal ballast) should typically not affect the flight significantly, though anything above that could impact the flight time.

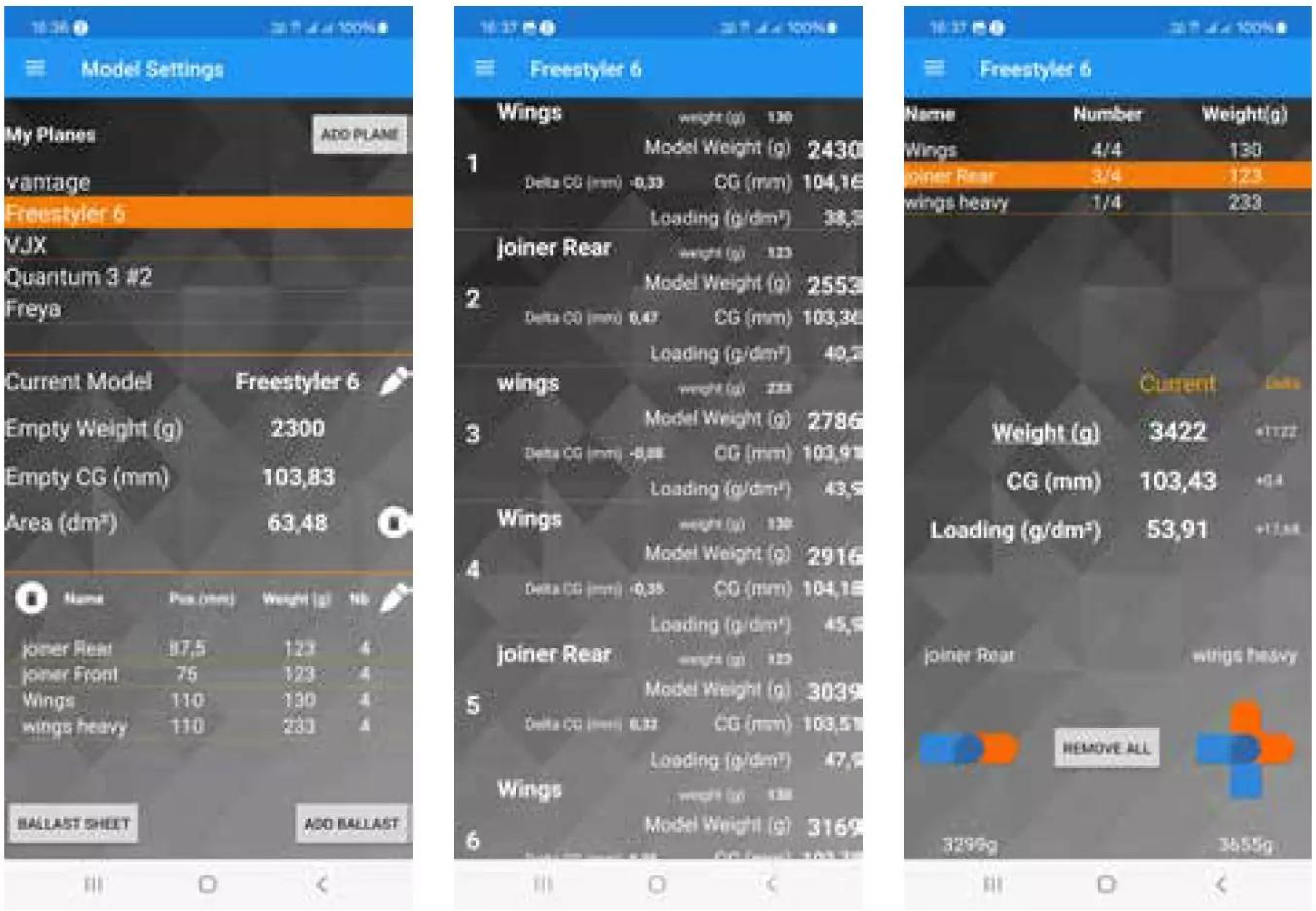
To assist you with ballasting your RC glider, several tools are available, including one particularly noteworthy application: the Ballast Management App. Developed by Joël Carlin and available on both Google Play and the Apple Store, this app is specifically designed for RC glider pilots. It helps calculate and optimize ballast configurations to ensure optimal performance across various flying conditions. The app simplifies and standardizes the ballast calculation process by providing a structured approach to determining weight distribution. This ensures that adjustments maintain the glider's center of gravity (CG) and overall balance. Additionally, the app ensures compliance with FAI regulations, such as the maximum wing loading of 75 g/dm^2 for FAI competitions.

A First menu allows to enter the glider characteristics and also the ballast configuration. This includes: Empty flying weight (without ballast), FAI Wing and Tail area (to calculate FAI wing loading), CG location (distance to the leading edge), and for each ballast compartment, the distance to the leading edge, and the weight of each slug and the number of slug. All calculations are preconfigured, allowing you to easily increment or decrement ballast as needed. The app ensures the best possible ballast distribution to maintain the center of gravity (CG) whenever feasible. If a CG shift is unavoidable, the variation is clearly indicated. With every action, the upper part of the screen shows the updated ballast distribution and highlights in orange the ballast compartments to load or unload. If the maximum wing loading (75 g/dm^2) is exceeded, the wing loading value is displayed in red. By double-tapping the word 'weight', you can input a target flying weight. The app then calculates the closest achievable weight and provides the corresponding ballast configuration. In summary, the Ballast Management App is an invaluable tool for F3F pilots and RC glider enthusiasts. It greatly simplifies the complex task of optimizing ballast while maintaining CG balance, making it an essential companion for precision flying.



Practical tips

- it is always a good idea to finish filling a ballast chamber with a spacer that can be quickly replaced with ballast weights without having to empty the entire chamber.
- In the mountains, the higher the flying area, the less ballast can be used. On the coast, however, more ballast can be added because the air is denser and more laminar.
- When approaching the maximum ballast, it may be advisable to gradually shift the centre of gravity forward to reduce the risk of stalling.



Model Settings

My Planes

vantage
Freestyler 6
VJX
Quantum 3 #2
Freya

Current Model	Freestyler 6
Empty Weight (g)	2300
Empty CG (mm)	103,83
Area (dm²)	63,48

Name	Pos (mm)	Weight (g)	Nb
joiner Rear	87,5	123	4
joiner Front	75	123	4
Wings	110	130	4
wings heavy	110	233	4

Freestyler 6

	Name	weight (g)	Delta CG (mm)	Model Weight (g)	CG (mm)	Loading (g/dm²)
1	Wings	130	-0,33	2430	104,16	38,3
2	joiner Rear	123	0,47	2553	103,36	40,2
3	wings	233	-0,88	2786	103,91	43,9
4	Wings	130	-0,35	2916	104,1	45,9
5	joiner Rear	123	0,32	3039	103,5	47,9
6	Wings	130		3169		

Freestyler 6

Name	Number	Weight(g)
Wings	4/4	130
joiner Rear	3/4	123
wings heavy	1/4	233

	Current	Delta
Weight (g)	3422	+1122
CG (mm)	103,43	+0,4
Loading (g/dm²)	53,91	+17,68

Screenshots from the excellent app that helps you make the right choice.

Google Play

Apple Store

Ballasting in F3F is a blend of science and intuition. It's about understanding the relationship between your glider, the slope's lift characteristics, and the wind's behavior. The goal is to maximize your glider's potential by tailoring its weight to the unique challenge of each flight. Whether flying on narrow cliffs or broad ridges, in light breezes or roaring winds, your ballast choice will often determine whether you merely survive the run … or dominate it! This is one of the reasons F3F is so lot of fun and addictive! ■

Pierre Rondel

MADE IN GERMANY

MODEL STANDS BY MICHAEL GERST

As an enthusiastic model glider pilot, Michael Gerst knows how important well-made accessories are. He was never satisfied with the model stands available on the market for building and assembling model gliders. So, he decided to take matters into his own hands.

Under his own brand, Ständer-Welt, Michael Gerst offers a series of model stands. There is already considerable interest from model aircraft enthusiasts and companies alike. The model stands are made of anodised aluminium and are currently available in two sizes: for models with a wingspan of up to approximately five metres and a weight of up to ten kilograms, and for larger models weighing up to approximately 25 kilograms. “The working height can be adjusted to an ergonomic position, depending on the size of the pilot, for assembly while standing or working while seated,” Michael Gerst reports in an interview with AUFWIND. He emphasises: “From small RES models to large gliders – simple, uncomplicated, universal.”

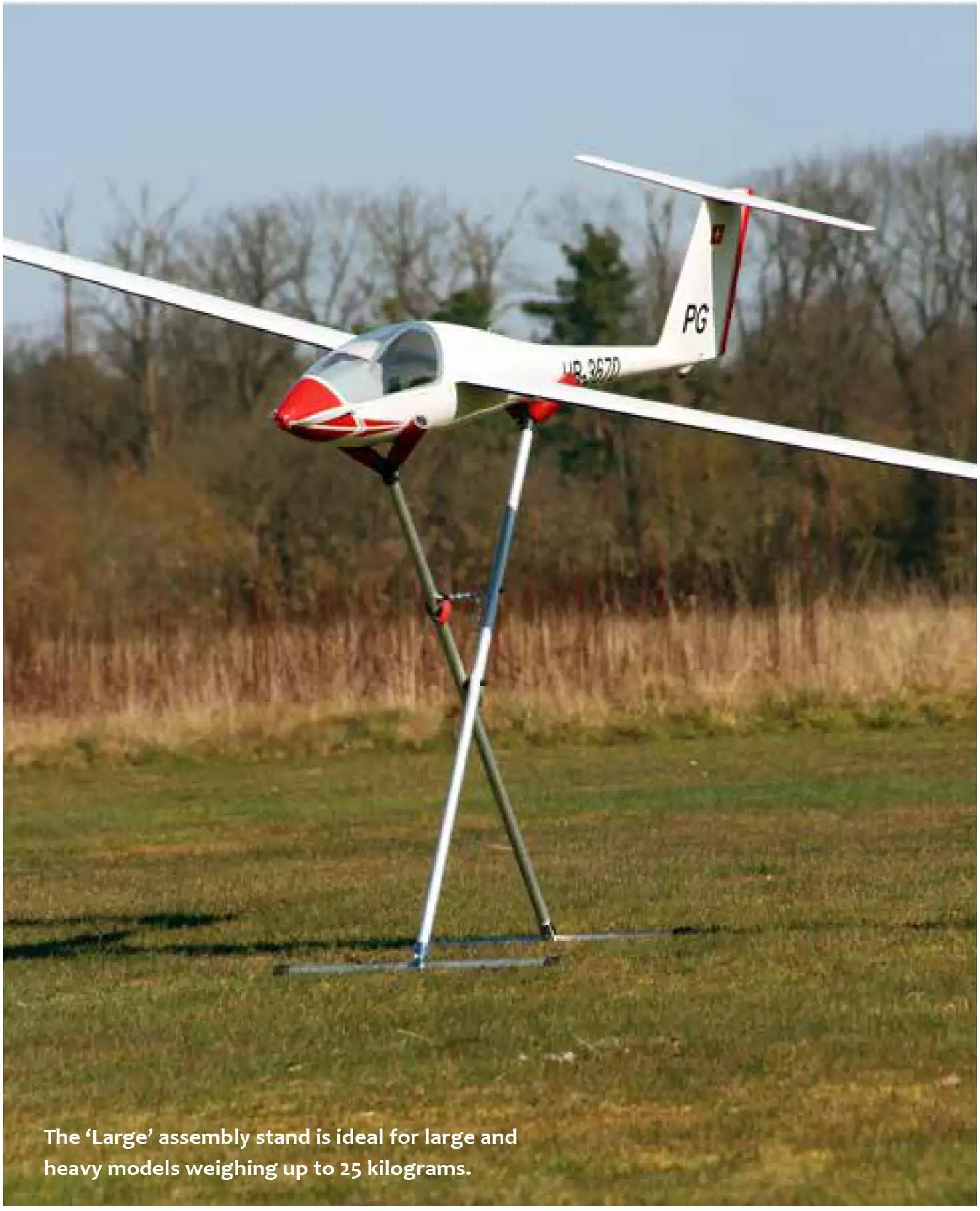
Thanks to the V-shaped mount, the stands are suitable for almost all models without any adjustments to the stand. But the stands are not only suitable for glider models, but also for motorised models, jets and helicopters. The support surfaces are interchangeable. The soft black support is recommended for sensitive wooden or foam models to prevent pressure marks on the model. For heavy models, use the robust, red-coated support. Both supports prevent the model from slipping or tipping over.

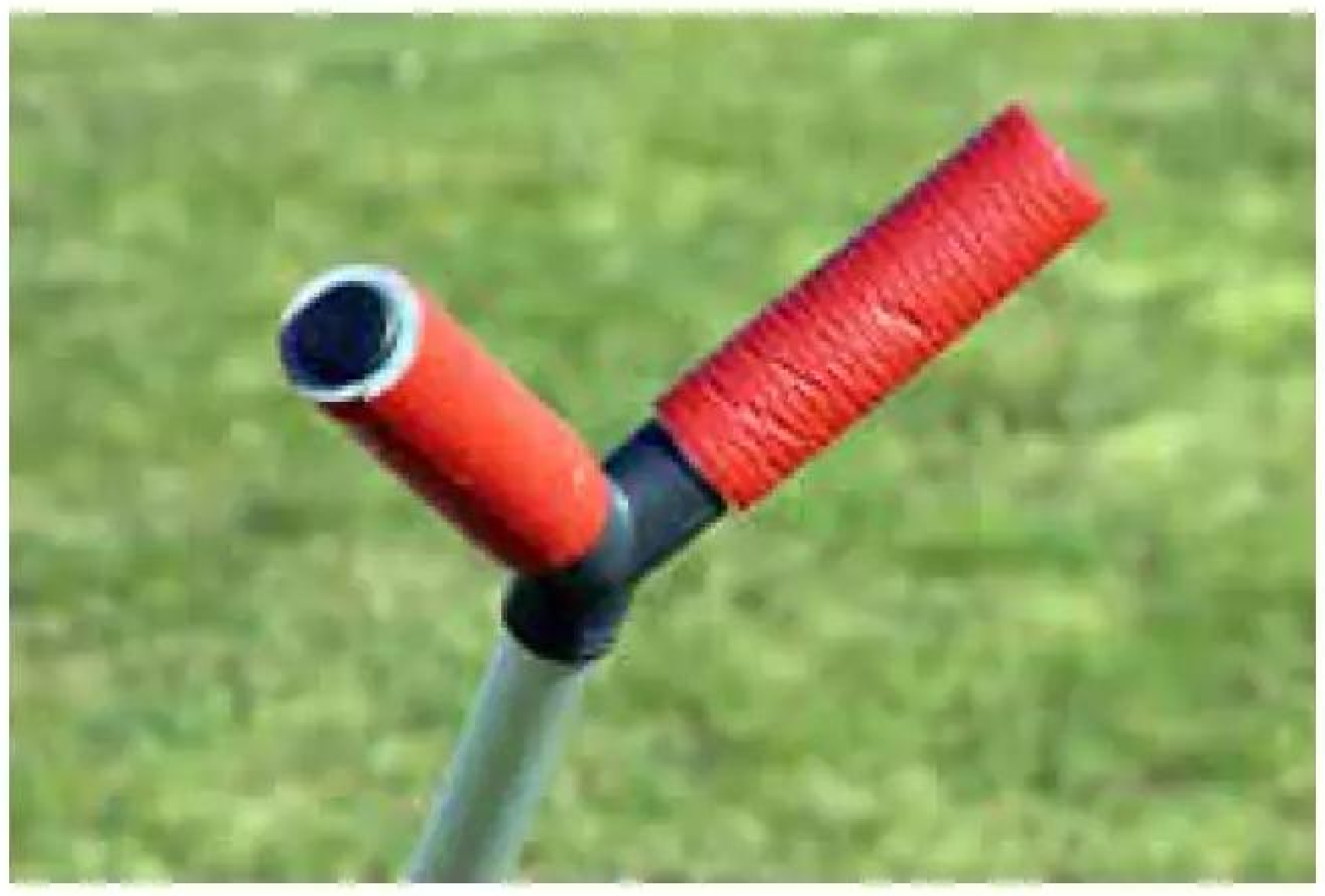
A horizontal stand for the building table complements the current range. ‘No more tipping or slipping when assembling fuselages and removing fuselages,’ explains Michael Gerst. The table stand is also suitable for safely transporting fuselages in cars. Michael Gerst also offers the table stand in an inexpensive PVC version. Useful accessories, such as cup holders, wall mounts and sandbags, are also available in the shop.

The model stands are shipped as an assembly kit including accessories. Assembly is very easy and takes only a few minutes. An up-to-date overview is available at www.staender.world.

■

Editorial team


The ‘Large’ assembly stand is ideal for large and heavy models weighing up to 25 kilograms.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PRO TIP #7

The storage of plywood sheets in model workshops is often neglected. This results in warped sheets, from which components can only be cut with great difficulty. The installation of warped components also causes problems.

The most important basic rule is: plywood sheets must be stored flat, dry and on a level surface. They must also be protected from moisture and temperature fluctuations. Larger sheets can also be supported with spacer strips to prevent moisture accumulation. If the sheets are lying on a cool cellar floor, for example, an extra-large distance from the floor should be chosen. Pine strips with a thickness of approximately 20 millimetres are suitable for this purpose. Distributing weights evenly can also help to prevent warping. This is particularly important if the boards are new or have been stored in damp conditions.

Under no circumstances should plywood be stored upright against walls or edges, as this will inevitably cause warping. There should also be no radiators or other sources of heat nearby.

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F3L-SCENE

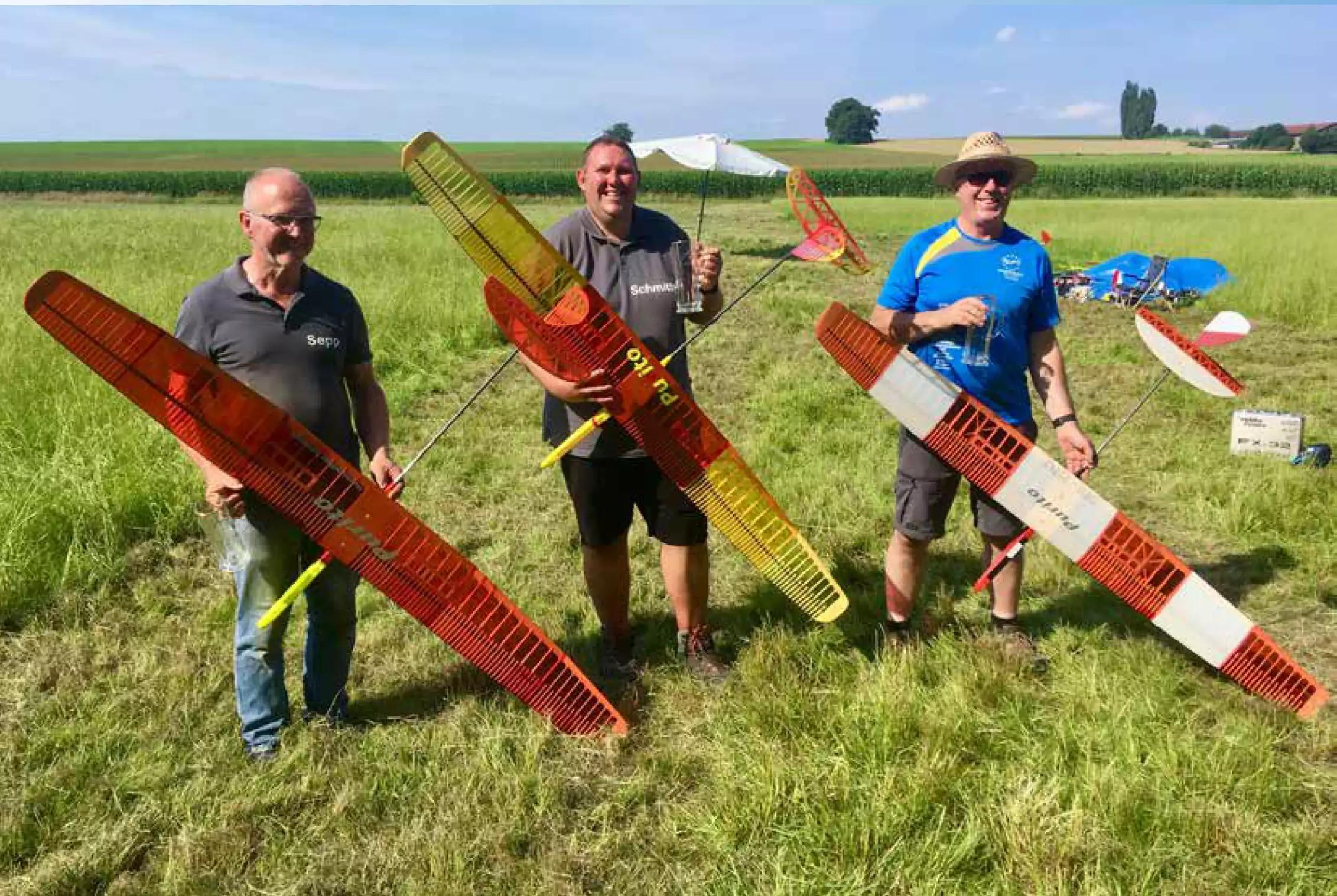
THE NEW FAI COMPETITION CLASS FOR RES MODELS

After a two-year trial period, the popular RES model class has now been approved by the World Air Sports Federation (FAI) as an official F3L competition class. Marcel Adler provides an update.

The F3L competition class, often still referred to as F3-RES, is becoming increasingly popular. Rising numbers of participants in competitions have even led to the introduction of waiting lists. F3L is a competition class for thermal gliding and is based on the basic idea of the F3J class. It is a distinct team sport with line handlers, timekeepers and coaches. The F3L class originated in Turkey and the USA. F3L pilots in Turkey were the first to put a set of rules on paper, thus taking the first step towards F3L now being officially recognised by the World Air Sports Federation (FAI). This means that international competitions can now be organised. World Cup competitions will be possible from next season onwards. A European and World Championship is planned for 2027. The first set of rules from Turkey served as the template for the European BeMod rules, which have been used for competitions in recent years. A few details have been added over time, some have been changed or removed altogether. Much attention has been paid to the wishes of the pilots. Applications for rule changes can be submitted annually until November of the current year. These are then forwarded to the FAI, where an internal committee votes on whether the rule change makes sense.

The basic rules of the F3L class in brief: F3L is a competition class for glider models with a maximum wingspan of two metres and no weight limit. The models are mainly made of wood, are controlled via two axes (rudder and elevator) and are equipped with an aerodynamic brake (spoiler). The brakes play an important role here, as they are the only way to achieve a precise landing (part of the flight task) and a rapid descent of the model from a great height. There have also been ultra-light series models without brakes in order to reduce flight weight. However, these have not caught on. A well-modulated brake is more important than saving the last few grams of weight. A good friend once said that you can compare it to a bike for mountain tours: a light bike is easier to ride uphill, but no one would think of riding downhill without brakes.

Three 'Purito' models and their pilots Josef Schweiger, Michael Schmidkunz and Frank Holz (from left). The model is distributed by Schweiger Modellbau and Hölleinshop. ▼



The ‘Slite V2’ was designed by ▲
Josef Gergetz and is widely used today.

▲ F3L is also a domain of homemade models,
here the conversion of a free flight model.

It is important to work very carefully when assembling the models. A well-built model flies well. A lot of attention must be paid to the accuracy of the profile. So you should already have some skill in working with wood.

ARF and RTF models are already available. The often very light models (approx. 400 to 450 grams) are launched from an adjustable high-start hook with 15 metres of rubber tubing and a maximum of 100 metres of line. This high-start line can be pulled to a maximum tension of four kilograms. The line length and tension vary depending on the competition and weather conditions. The length can be shortened to 50 metres, for example if space is limited. Training is usually done with 50 or even just 25 metres of line. After all, we want to fly thermals and not glide down after take-off. Other advantages of a short line are that team members don‘t have to retrieve as much line and, in windy weather, there is less risk of the launch lines becoming tangled, which can lead to interruptions in the competition.

The flight task consists of achieving a flight of exactly six minutes within a time frame of nine minutes after releasing the high-start hook (starting height: approx. 60 to 80 metres; with 50 metres of line and 15 metres of rubber). After this time, the model must then land as accurately as possible on the landing point. Every centimetre count, and every deviation results in points being deducted (max. 100 points). In the end, it is often a matter of centimetres that decide between victory and defeat. Likewise, every second under or over the six minutes results in a deduction from the maximum number of points. The number of starts is not limited within the nine-minute time frame. This allows the pilot to make another start immediately if there was no thermal connection during the previous start. The last attempt is always evaluated, not the best result. However, if the pilot is not back on the ground after the nine-minute time frame has elapsed, no landing points are awarded. After 9:30 minutes, the entire flight is cancelled. The competition is scored in groups, with up to eight pilots competing in each group. The best pilot in the group, who achieved the best flight time and maximum landing points, receives 1,000 points for the respective round, while the points of the other pilots are normalised on a percentage basis. After at least three rounds have been scored, an overall ranking is possible. And after five rounds have been flown, the worst round can be discarded. This means that pilots can afford to make a mistake. However, the number of rounds that can be flown in a day ultimately depends on the weather and the organised schedule of the competition.

Thermal flying is the big challenge in F3L sport. Observing and recognising the model and nature are fundamental aspects. A good explanation of how thermals behave and how they can be located, as well as a lot of training, are all part of it. The feeling when you finally manage to climb up to the horizon in a thermal bubble is difficult to describe in words. You have to experience it for yourself.

Very successful last year:
Louis Bendixen from Team
Holzklasse.eu, here with his
father Nils as coach.

That‘s going to be a 100-point landing.

‘Prime II’ and ‘Prime III’ from CLM Pro in Croatia.

The ‘Antares Standard’ in the 2025 model version with D-Box.

The consistently good atmosphere and friendly camaraderie among F3L pilots are particularly noteworthy. Even as a newcomer, you quickly find your place and become part of the group. Beginners are always welcome, and friendships are quickly formed. A group of young people is taken under the wing and supported by experienced top pilots such as Henry Sander (F3K world champion and designer of the F3L model ‘pRESet’) and other big names in the scene. Louis Bendixen was particularly outstanding last season, even flying his way onto the podium in the adult classification. However, other young people such as Paula Strauss, Lars Schmittkunz and Samweis Bufe are also showing a great deal of ambition and talent. The new 2025 season has also brought some new faces, with Lilith Bruckhoff securing 10th place in the overall standings and 3rd place in the youth standings at the season opener in Hüttenberg. F3L is a class that is ideal for those looking to get into competitive flying.

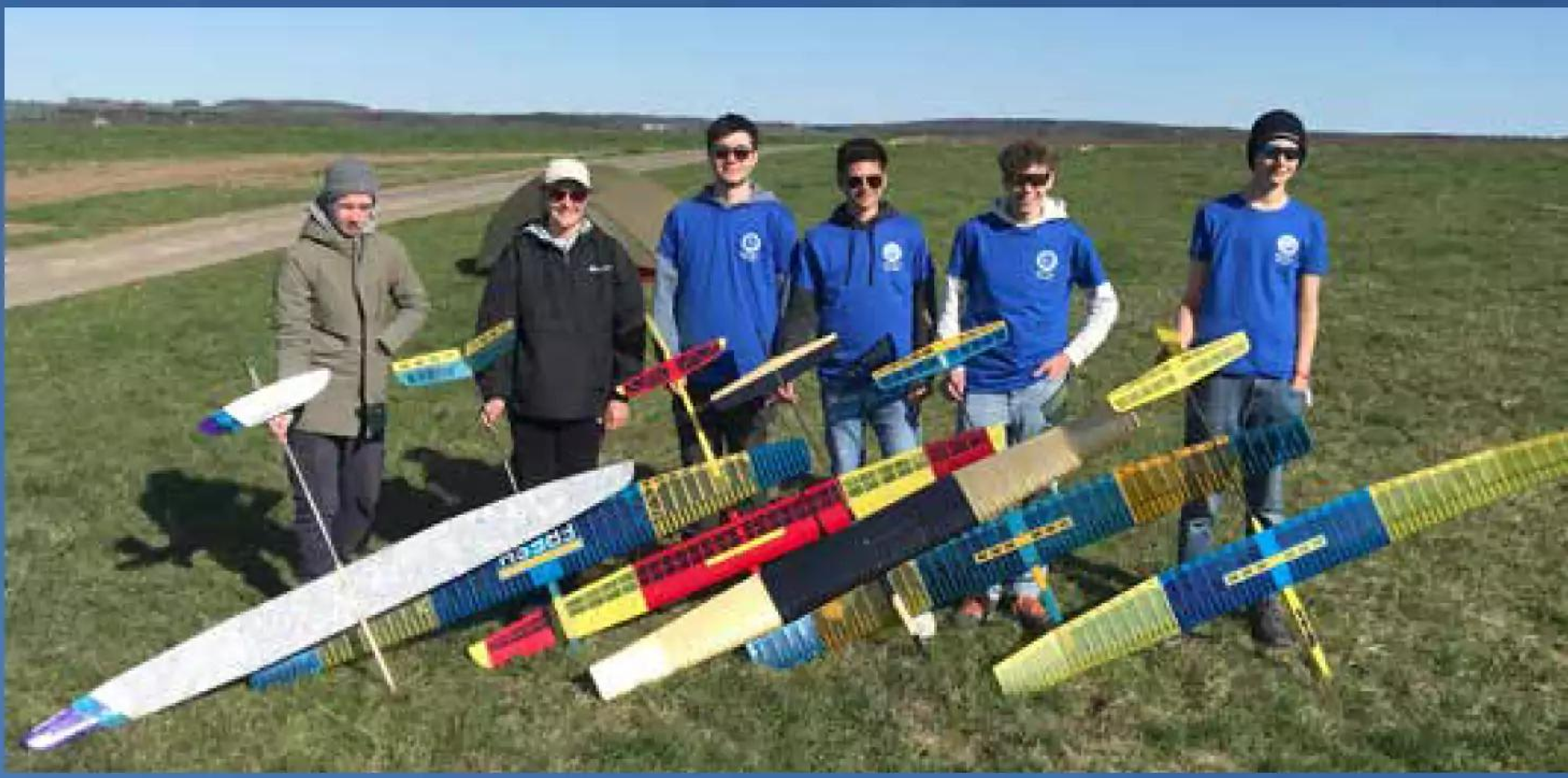
Two to three years ago, the selection of models suitable for competition in the F3L class was still very small. At the end of 2023, however, there was a real surge and many new F3L models were launched on the market. Due to the wooden construction specified in the regulations, purchasing an F3L kit is not a major investment. Most kits are available at prices between £180 and £300. In addition, you will need four servos, covering film, a battery and the receiver. Used models are usually sold at prices of around £300. They are definitely worth considering for those looking to get started in the competition scene.

Individual models have proven to be very powerful and dominate the starting field of a competition. But homemade designs and classics from previous years, such as ‘RESolution’, ‘Pures’, ‘Slite’ and ‘Picares’, are also always present. Models such as ‘Minores’, ‘X-Dream’, ‘X-RES’ and ‘Desire’ by the late Alois Janowetz could also be described as timeless and still competitive. In the end, however, it is always the pilot who decides victory and defeat.

One of the best-known F3L models to date is the ‘Purito’ by the German Josef Schweiger (www.holzmodellbau-schweiger.info and www.hoelleinshop.de). Schweiger offers a choice between an extra-light version made of light-

The launch is 25 metres of rubber and up to 100 metres of line.

weight wood or a kit made of stronger material, allowing you to select the model that best suits your intended use. You can also choose whether you want the horizontal stabiliser to be located in front of or behind the vertical stabiliser. Pilots have dominated the rankings with the ‘Purito’ for a long time. Josef Schweiger is already putting new ideas into practice and is working hard to ensure that the ‘Purito’ gets a powerful successor.



Many young people fly F3L. Here are the participants at one of the first competitions of the year in Germany (from left): Leo Donner, Lilith Bruckhoff, Elias Steffen, Sayder Karakaplan, Finn Vorschulze and David Santo.

The ‘Prime III’ from Croatian manufacturer CLM Pro has also found many fans. Now in its third generation, each new version has been designed to meet the wishes of pilots. It is a powerful F3L model that is ideal for weather conditions with no wind up to five metres per second. However, it is reported that CLM Pro has now also developed a model for higher wind speeds. It goes by the name ‘Roko F3L’. Initial photos suggest that it is not simply a ‘Prime IV’ but a completely new model. The models can be ordered directly from CLM Pro (www.clm-pro.com) or from Modellbau Zeller (www.zeller-modellbau.com) in Austria.

The ‘Encanto X’ and ‘Encanto Camber’ models from F3J world champion and successful F3L pilot Jan Littva (Slovakia) also promise excellent performance in a variety of wind conditions. A special feature is the perforated brake flaps, which allow the model to apply the brakes very smoothly and keep the model stable during approach. This makes precise landings much easier, especially in stronger winds. The ‘Encanto’ models are marketed directly by Jan Littva together with Karol Chyba (www.litteamcup.sk).

The model that attracted a lot of attention last season is the ‘Antares’ from German company Holzklasse.eu. Many years of competition experience in various thermal flying classes have left their mark here. The first design of the ‘Antares’ was already an extremely powerful F3L model. The model is available in ‘Light’ and ‘Standard’ versions. The ‘Antares’ is ideal in the otherwise dreaded backcountry, as it can fly against the wind like no other model and can thus be flown back to the landing point. In the ‘Light’ version, weighing 350 grams, the model also detects the smallest thermal bubbles. Another strength of the ‘Antares’ is the possibility of adding ballast with brass plates in the wing of up to 210 grams in the ‘Standard’ version. With tungsten weights, flight weights of over one kilogram can even be achieved. The construction of the ‘Antares’ can withstand this additional load without any problems.

With the German Modellbau Pollack, we have another dealer offering F3L models. Here you will find, for example, the new ‘Chilli’ from Hobbyarena.cz or the ‘Wikki’ and its successor ‘Revolt’ from Tomáš Hlavinka. A special feature is the negative V-shape of the horizontal stabiliser. This is primarily intended to improve circling performance.

It would go beyond the scope of this article to list all the models currently available on the market. However, I will take a closer look at individual models in one of the next issues and also report on the latest developments in the F3L scene. ■

Marcel Adler

Points are deducted for the distance to the landing point. Here is a self-built model at the competition in Röhrmoos near Munich (Germany).

Marcel Adler

F3L competition pilot for three years and, since the end of 2024, active representative of the German Model Flying Association (MFSD). He is in direct contact with many producers and manufacturers, which has enabled him to get to know a large number of models and, in some cases, to collaborate on further developments. Marcel Adler is available to provide advice and assistance to interested parties and pilots.

aktivensprecher-F3L@web.de

YOUNG ATHLETES

LOUIS BENDIXEN FROM NORTH-GERMANY

Louis Bendixen has been flying for just over two years and became German Junior Champion in the F3L class last September. He is now nine years old. His club colleague Matthias Doering introduces him.

From an early age, little Louis always went to his father Nils' model-making workshop. Other children had their bedrooms, where they played with Lego bricks or similar toys. Louis was completely different; his domain was the workshop. He quickly got his hands on things. At the tender age of three and a half, he had already built a free-flight model. He enjoyed his first successes in the free flight class at competitions in the youth group of his local club, FAG Kaltenkirchen, and soon wanted a remote-controlled model aircraft. Louis got his first RC system at the age of six and built the model together with his dad. The model, designed by Pascal Eckert, already had many of the features of the models in the F3L competition class. Louis started competitive flying at the age of six and a half. He flew in the F3L class with the adults, without a youth classification, and showed both ambition and enjoyment. His motto was to get ahead and show the big boys! And he was successful: in May 2024, shortly before his eighth birthday, Louis took first place in the youth classification at an international F3L competition in Nönü, Turkey.

But Louis also caught the attention of the competition scene in Germany! He won the title of German Junior Champion at the German F3L Championships in September 2024. Shortly before that, at the D-Tour and Contest competition in Blankenburg (Germany), Louis had already shown that F3L flying is his forte: after two fly-off rounds, Louis finished third in the overall standings. In the youth classification, he prevailed against three other young pilots and took first place.

The FAG Kaltenkirchen is delighted to have him in its ranks and wishes him continued success.

■

Matthias Doering

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The ‘Taylorcraft’ from Fun-Modellbau was powerfully motorised with an ‘L8038-120 V2’ motor and 12s LiPo.

ELECTRICS, DONE, CORRECTLY

THE GLIDER TUG DRIVE YOU WANT

There are many myths surrounding the design of drives for electric tugs. Markus Müller has taken a detailed look at the subject and explains the approach to designing an electric drive for a tug using ‘propCalc’ from Ecalc.ch.

150 watts of power per kilogram of flight weight is the key figure for designing a powerful drive for an electric tug. But what else do we need to design our tug for safe and efficient glider towing operations?

Once you have decided which tug to use, the following key data is required: wingspan, wing area and expected flight weight. Alternatively, the weight of the airframe can also be specified. Now we ask ourselves: what is the maximum weight of the glider I want to tow? This determines the total weight of the combination. Let‘s assume a total weight of 30 kilograms for the tow plane and the glider model. Experience shows that 120 to 150 watts of electrical power per kilogram is required for safe towing. We now multiply our total weight by 150 watts to obtain the required input power for our drive: 30 kilograms x 150 watts = 4,500 watts.

In the next step, we determine the number of cells in our battery and assume a 12s battery in this example. We determine the nominal voltage of the battery to be 44.4 volts (12 x 3.7 volts). This gives us an estimate of the maximum current, which is the result of the required input power divided by the nominal voltage: 4,500 watts / 44.4 volts = 102 amps of current consumption.

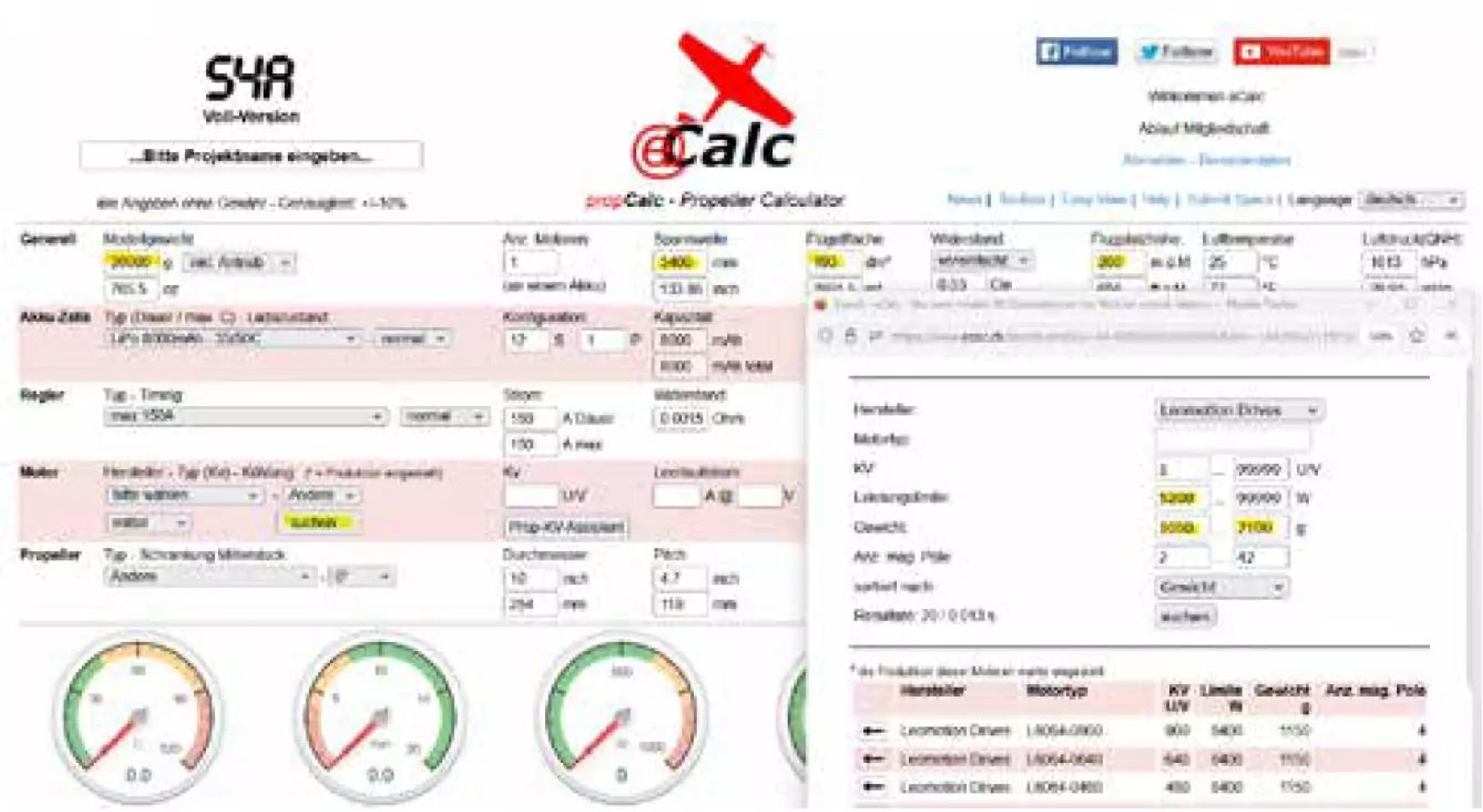
The geometry of the towing machine determines the appropriate propeller. We select the largest possible propeller that still offers sufficient ground clearance. For example, 22 inches: A good pitch/diameter ratio for the propeller for our application is between 0.5 and 0.65, which means we use a 12-inch pitch for our propeller. This should achieve a pitch speed of at least 100 kilometres per hour – or rather 130 for large gliders.

This gives us all the key data we need for the drive simulation: we are looking for a motor with a continuous output of at least 4,500 watts. By varying the specific speed KV, we select the motor type that gives us the required power with a 22 x 12 inch propeller. To determine an initial estimate of the motor size, we take into account a real power throughput of 2.5 to 5 watts per gram. This means that our motor will weigh between 900 and 1,800 grams. We calculate the input power of 4,500 watts divided by 2.5 watts per gram. With this initial data, we now use the simulation programme ‘propCalc’ from Ecalc.ch and refine our calculation iteratively.

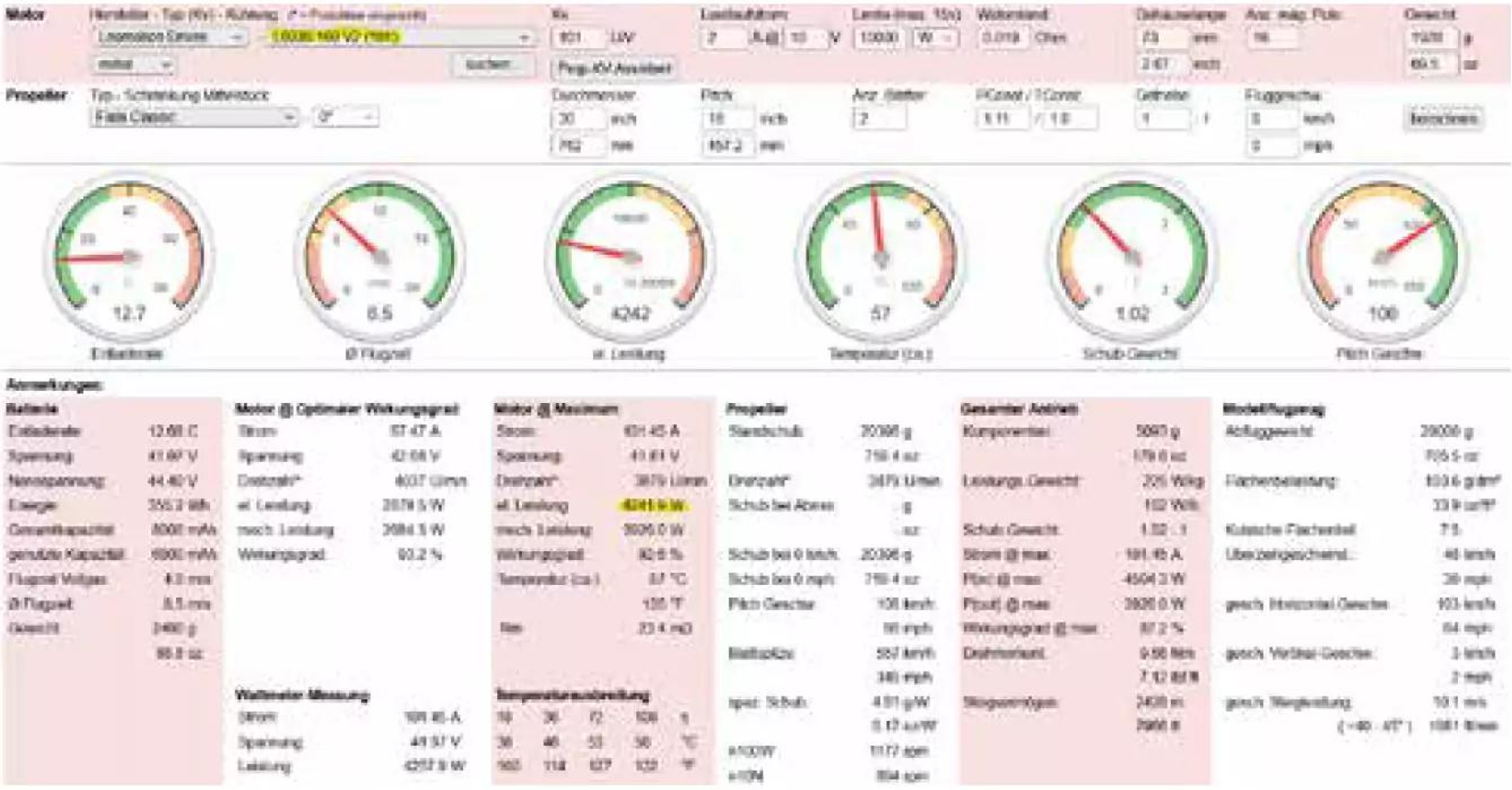
A concrete model example is the ‘Taylorcraft’ from Fun Modellbau presented in AUFWIND 4/2021. The task was to be able to tow glider models weighing up to approximately 15 kilograms safely. The model has a wingspan of 3,400 millimetres, a wing area of 193 square decimetres and should weigh approximately 20 kilograms. With the requirement of being able to tow 15-kg gliders safely, this resulted in a total tandem weight of 35 kilograms and a required input power of 5,250 watts (150 watts per kilogram). The drive was to be equipped with an already available 12s LiPo. At a nominal voltage of 44.4 volts, a current consumption of around 120 amps is therefore required. The geometry of the model suggested a propeller of up to 30 inches. We started with 30 x 20 inches, but would play around with the propeller size a little more later on to optimise it for the motor selection.

We calculate the approximate motor size based on the power throughput of 2.5 to 5 watts/gram and obtain a range for the motor weight of 1,050 to 2,100 grams: 5,250 watts : 2.5 watts/gram = 2,100 grams.

Now we use ‘propCalc’ from Ecalc.ch to help us. For clarity, we limit ourselves to motors from Leomotion Drives, enter the known key data and search for possible motor candidates (see Figure 1). We select the heaviest motor with the lowest KV (‘L8038-100 V2’) and perform a calculation. We obtain an initial result (see Figure 2). We find that the simulation results in an input power of only 4,241 watts and a pitch speed of 106 kilometres per hour – which is too low. Now we begin the refinement process and try to increase the



The calculation was started with the heaviest motor with the lowest KV (‘L8038-100 V2’).



The first calculation resulted in an input power of only 4,241 watts and a pitch speed of 106 kilometres per hour – too little power and pitch speed. We have several levers at our disposal: increase the speed by using a motor with a higher KV or reduce the propeller diameter and/or increase the pitch. Since we have already selected the largest possible propeller in this case, we opt for a higher KV (specific speed) and select the 'L8038-120 V2' (see Figure 3). Now we have exceeded our target with 6,450 watts and will subsequently reduce the power consumption by selecting a smaller propeller. The next smallest propeller size is 28 x 18 inches, and with 5,333 watts of power and a pitch speed of 126 kilometres per hour, we are close to the required data. At 62 °C, the temperature prediction is well below the limit of 80 °C. With this temperature reserve, we could choose the next smallest motor ('L8025'), which, due to the higher KV, significantly increases the power consumption. This can be compensated for with smaller propellers, but this would take us further away from our specifications. We have therefore found the right motor: 'L8038-120 V2' with a 28 x 18 inch propeller.

We can now perform a comparative test to estimate the flight performance with the glider. We change the take-off weight from 20 kilograms to the total weight of 35 kilograms (see Figure 5). The results show that three climbs of 500 metres each (climb rate: 1,635 metres) are possible. This can be increased, if necessary, by increasing the battery capacity.

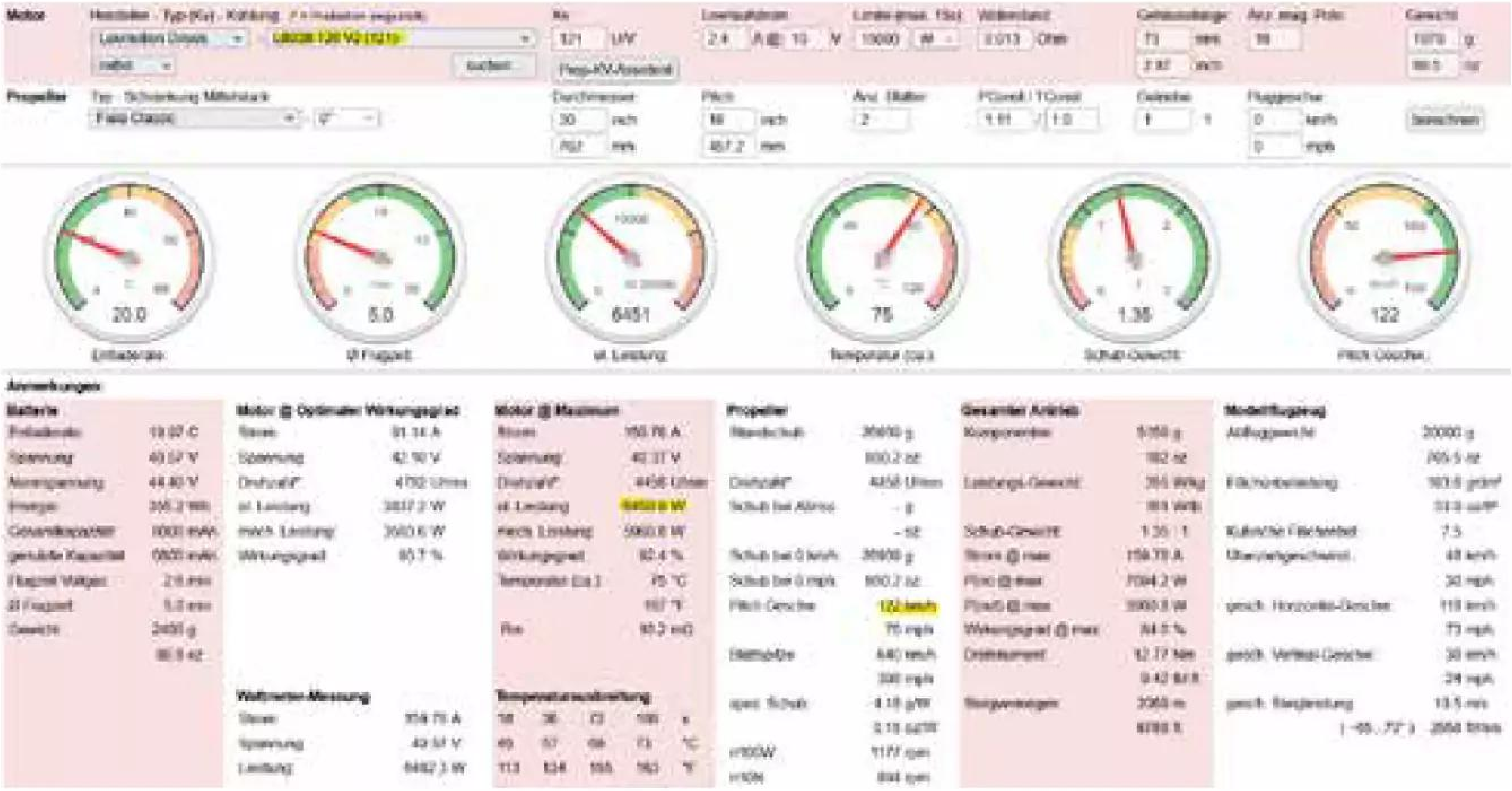
Since we have consistently calculated a specific power of 150 watts/kilogram for safe towing, experienced and sensitive tow pilots can reduce this figure to 120 watts/kilogram, which would allow a maximum weight of approximately 23 kilograms for the glider (5,250 watts : 120 watts/kilogram = 43 kilograms total weight).

I wish you lots of fun and success with your electric tow flights. ■

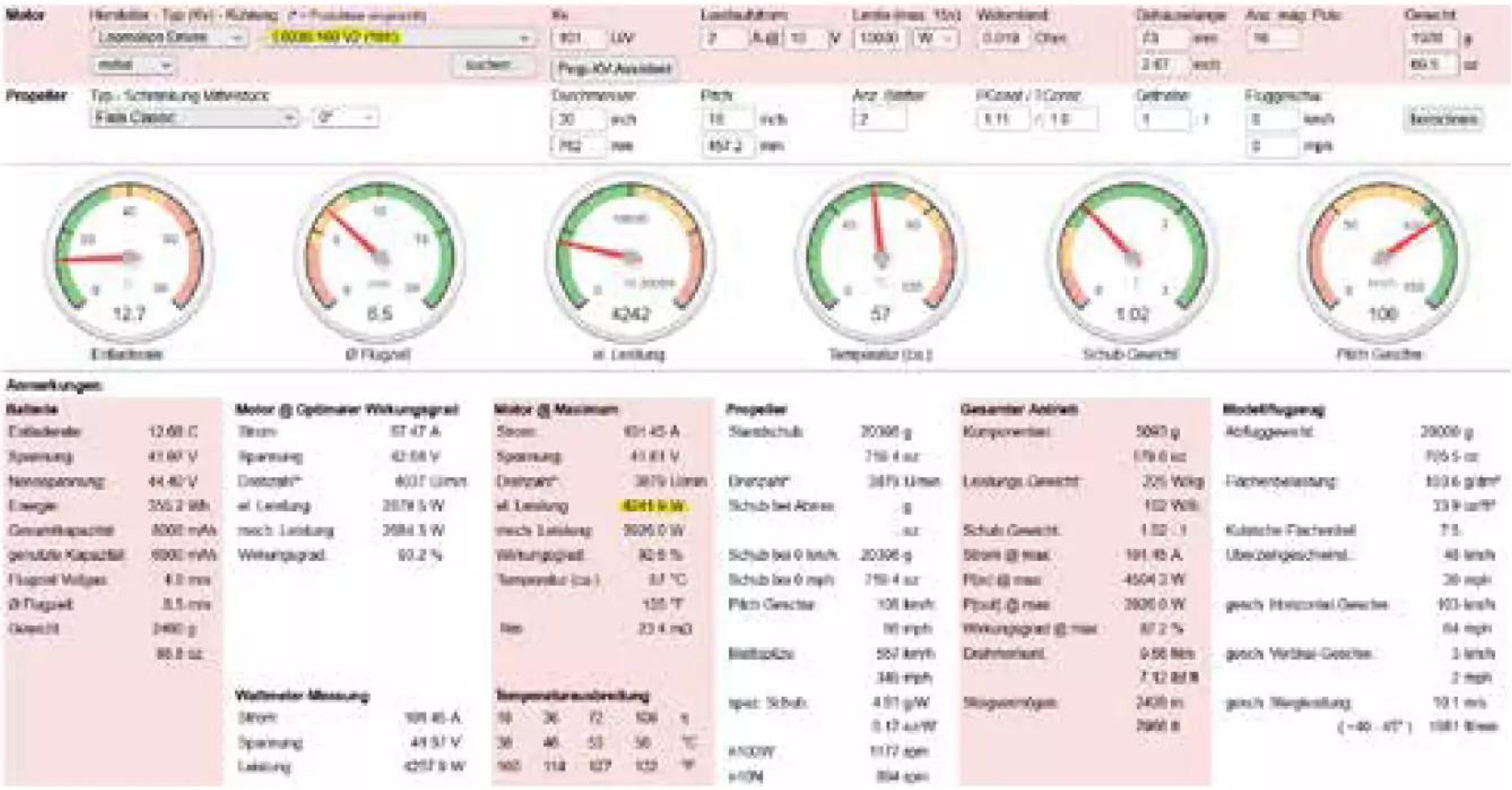
Markus Müller
www.ecalc.ch

INFO

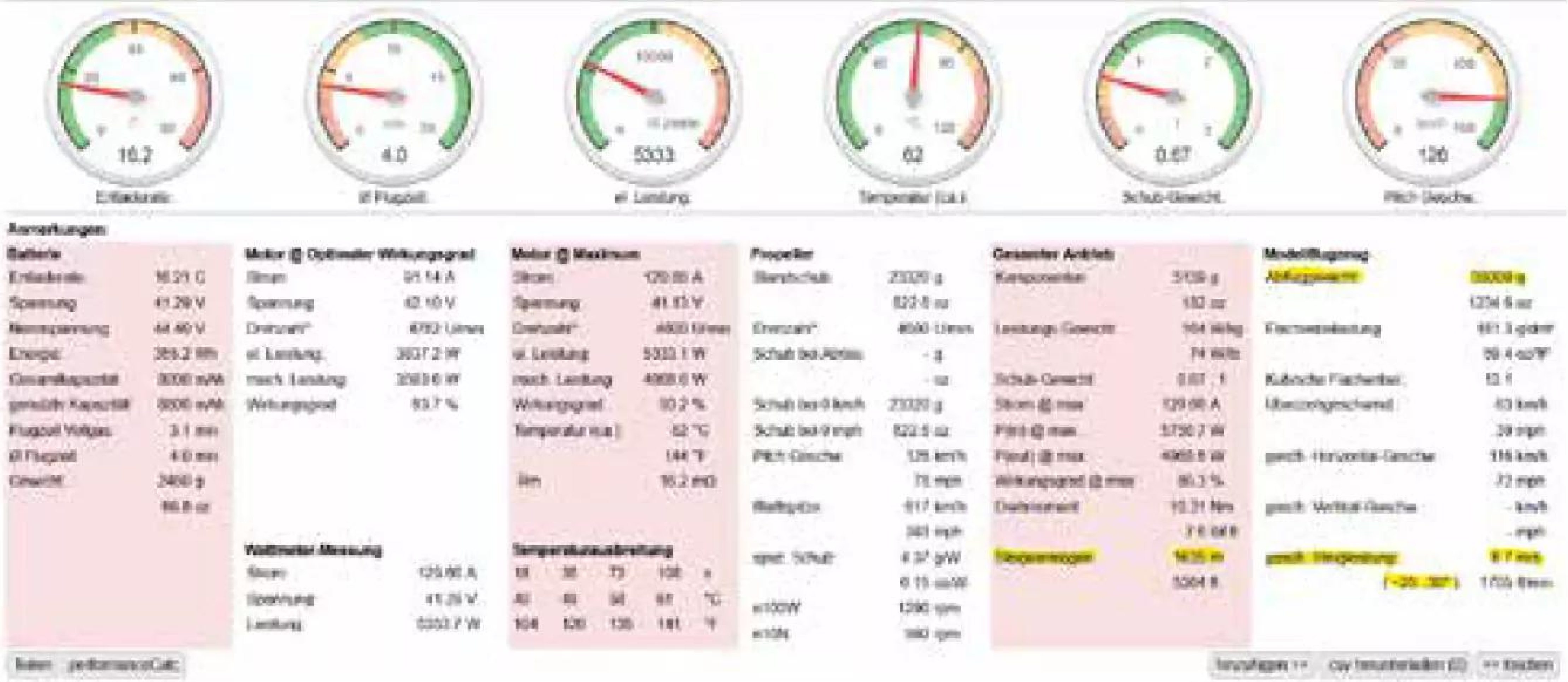
AUFWIND readers can use the full version of the simulation tool „propCalc" for free at www.ecalc.ch until 5 July 2025.
User name: Aufwind
Passwort: Schlepper



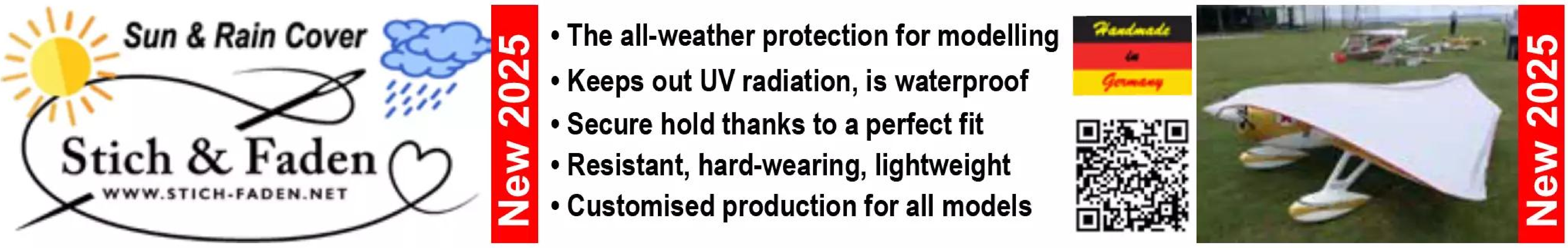
With a higher KV, we initially overshot our target.



The third calculation with the smaller 28 x 18 inch propeller yielded the desired result.



Here is the determination of the climb performance with a total weight of 35 kilograms.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TWO ENGINES
FOR FUN

THE 'PISTON TWIN 150' FROM HÖLLEIN – PART 2

FACTS

'Piston Twin 150' from Höllein
A twin-engine aircraft for everyone

Wingspan . . . . 1,500 mm
Length . . . . 1,400 mm
Weight . . . . 4,120 g
Wing area . . . . $39.75\ \text{dm}^2$
Wing loading . . . . $103.6\ \text{g/dm}^2$
Price . . . . 619,- euros

*Available from Der Himmlische Höllein, phone: +49-9561/555999, **www.**hoelleinshop.com.*

In AUFWIND 2/2025, Philipp Gardemin already presented the building of this beautiful twin-engine aircraft from the Höllein kit. On a freezy but really beautiful January day, the model flew for the first time and continues to thrill its builder to this day.

In October last year, after only a few months of building, the shell of the ‘Piston Twin 150’ stood before me. The scale showed a weight of 2,198 grams. That was really satisfying. But how should I proceed now? Just put iron-on film on it? Apply a complex coating, primer and paint? Should I even add more detail to the surface? I gave myself some time to make a decision, first coating the entire model twice with Aeronaut pore filler and then sanding it down again. I am always amazed at how beautiful the surfaces of balsa wood become after a coat of pore filler.

I wanted to retain a certain classic charm in the design of the model. So, no high-gloss, film covering, but rather something rustic. Then I noticed some leftover covering paper in the workshop. I could ... yes, that should work: I stuck the paper onto a piece of scrap wood, coated it again with pore filler and gave it a fine sanding. Yes, that was a surface I liked. It was full-coloured, silk matt and the wood structure remained visible. I could build on that.

I ordered ten sheets of red covering paper from SG-Modellbau. Over several evenings, I coated the entire model with it. To prevent the wood surfaces from swelling, I worked exclusively with Aeronaut wood filler. To do this, I placed the paper on the primed and dry surface and then rolled it firmly with a foam roller soaked in wood filler. It goes without saying that this work should only be done outdoors or in well-ventilated rooms directly next to a window! After the first coat of pore filler, I sanded everything down with 400-grit sanding fleece. I had to be careful not to sand through the paper, especially at the corners and edges. The result was a bright red ‘Piston Twin’, ready for further detailing. But first I installed all the flaps and rudders. I attached the ailerons and landing flaps with adhesive tape and the tail rudders with 3 mm pin hinges.

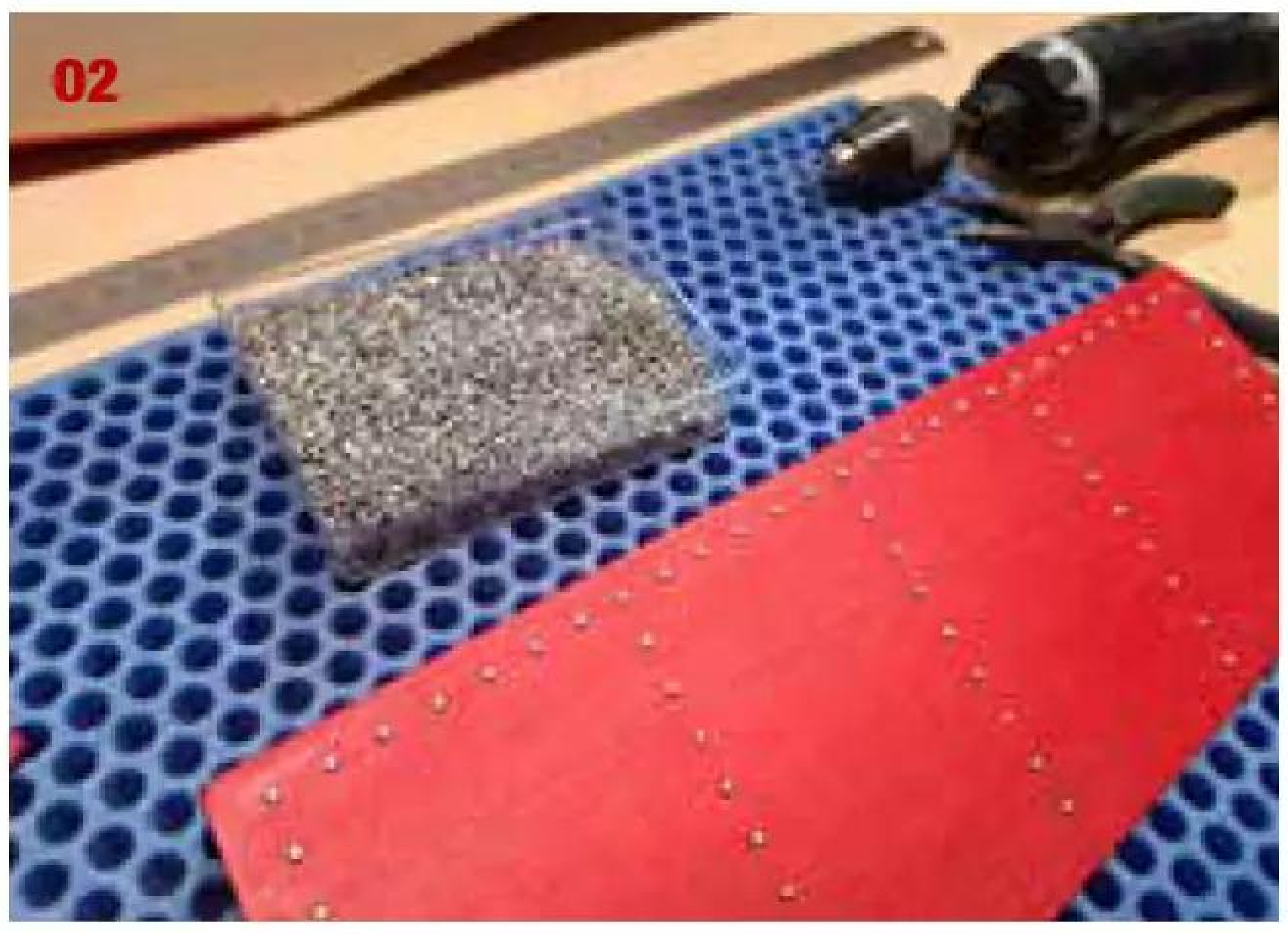
On the shelf behind me was a tin of aluminium rivets from Extron Modellbau, which I had already used in abundance when building the ‘Antonov AN-2’ biplane. The drilling template was also lying next to it. I couldn‘t resist: I started with the ailerons and landing flaps. Then I did a few rows on the fuselage. By the end of the evening, all the rivets were in place. I gave everything a final coat of pore filler and then a fine sanding. This ensured that the rivets were securely bonded.

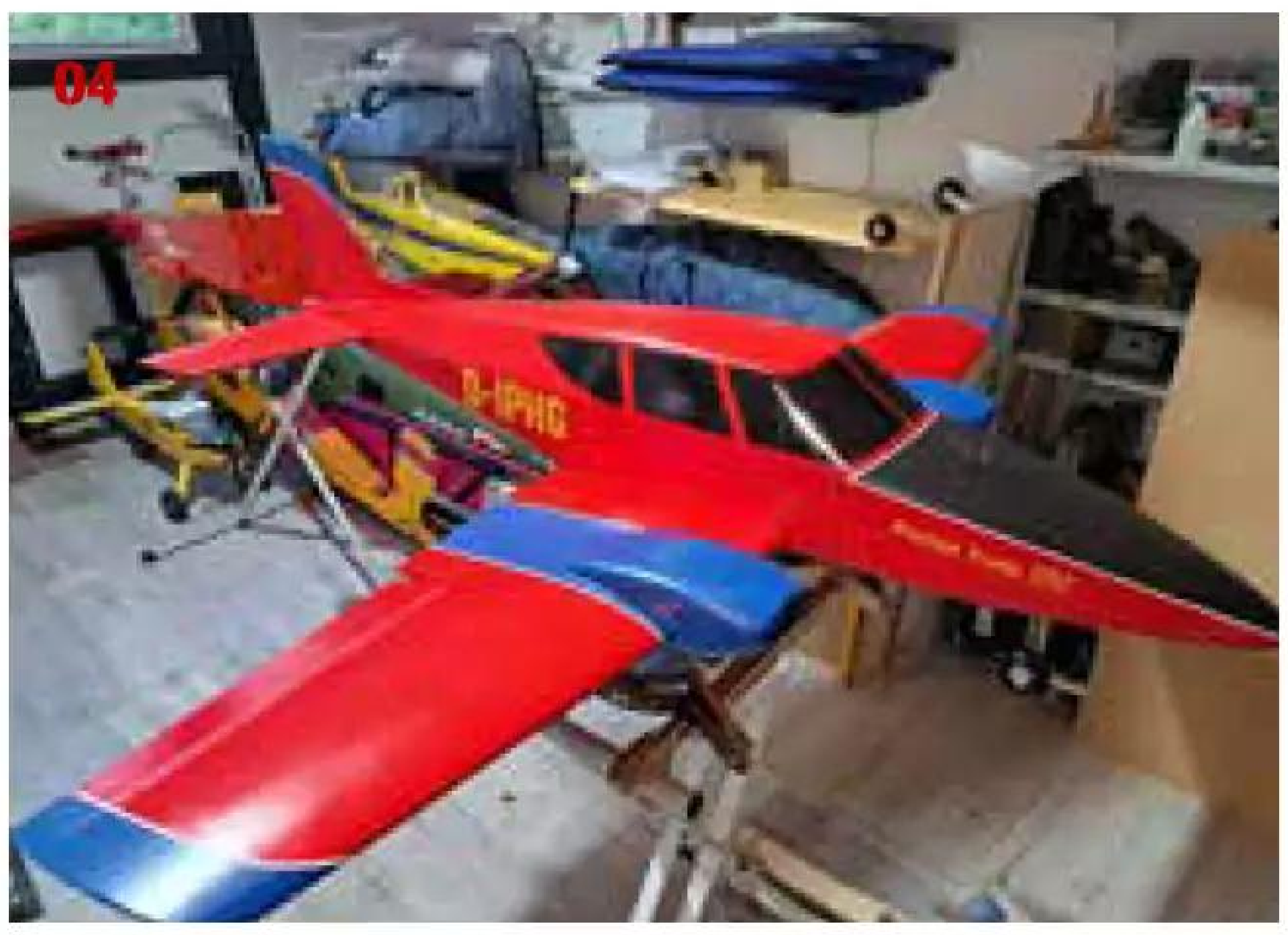
I sprayed the wing tips with matt blue paint, drew wide stripes across the engine nacelles and also added some to the vertical tail. The upper fuselage between the cockpit and the nose was sprayed matt black. I highlighted the paint edges with white Oraline adhesive tape. The glued-on cockpit windows were included in the kit. I created the lettering with the registration number and model name myself on a vinyl cutter. Why yellow? Because that was the only adhesive film I had left. And it was Saturday evening. The result, however, was a ‘Piston Twin’ that is sure to be one of a kind in this colour scheme.

When it comes to equipping the model with remote control and drive components, I always like to rely on the information provided by Höllein. They know what they‘re doing and it works. I deviated from the instructions in one respect: instead of the ‘AGF-RC, B13DLMV2’ servos recommended in the shop, I opted for the ‘DS-115’ from CHA-Servo (23 x 11.5 x 24.5 mm, 15 g). The dimensions are identical, so no reworking of the model was necessary. All the small parts needed to create the linkages were included in the kit. All that remained was to glue in the control horns and install the threaded rods with fork heads. I covered the free threads of the landing flaps and ailerons with red heat-shrink tubing. The electric retractable landing gear, which is included in the model kit, was also installed and wired at this stage. I painted the wheel wells beforehand with a soft brush and black paint. Incidentally, the receiver is not located in the fuselage, but on the centre section of the wing. The designer has provided a special platform here, which also offers sufficient space for it.

D-IPHG
Piston Twin 150

01 **Instead of paint or iron-on film, the model was covered entirely with red covering paper and coated with pore filler.**
02 I 03 **The rivets drilled in by Extron give the model an authentic touch. The rows of rivets on the fuselage were also invented, but they look really good.**
04 **Blue spray paint, white adhesive lines, yellow lettering and a little black paint on the nose of the fuselage – that's all it took.**





The motors are from the D-Power range: the 'AL3542-07' weigh 135 grams each and have 810 kv. Höllein recommends APC propellers with 10 x 7 inches. Together with 40 mm aluminium spinners, they look really great on the model. There is one controller directly in each motor nacelle. This meant that the battery cables had to be significantly lengthened. Even if the textbooks say otherwise, it works perfectly. The 4s LiPo battery is located in the nose of the fuselage under a removable cover. This makes it easy to change the battery and also ensures that the centre of gravity is right from the start. But be careful: only the 'SLS Xcube' (160 x 50 x 31 mm, 527 g) with 5,800 milliampere hours recommended by Höllein fits in the battery compartment. It cannot be any higher than 31 millimetres. There is only enough space in terms of length. When selecting the controllers, I opted for two 'Powerbeast C40' from Composite RC Gliders. These controllers offer a powerful SBEC and are set to 8.4 volts. With the programming card, they can be programmed with a flick of the finger. I almost overlooked it: the landing gear are low-voltage versions. Here, I had to use voltage reducers between the receiver and the landing gear.

Finally, the 'Piston Twin' stood before me, ready to go. The centre of gravity scale showed 4.12 kilograms. That was about 250 grams above the manufacturer's specification, but absolutely fine given my elaborate surface design. With great anticipation, I set off on a sunny and calm day for the maiden flight. The 'Piston Twin' rolled beautifully to the take-off position on the meadow. I was already thrilled by the sound of the two engines. With all flaps in strake, the aircraft accelerated, took off cleanly, the landing gear retracted and the model rose steeply into the steel-blue sky. Was that it? No trimming or corrections necessary? The beautiful twin-engine aircraft could be flown just like that? Yes, indeed. The 'Piston Twin' was stable in the air. I also liked the rudder deflections, which I had set according to the instructions, and I was able to enjoy the flight right away. The bright red against the clear sky looked great. A test of the flaps was also positive, although there was still a little too much elevator mixed in. But that wasn't a problem, and I managed my first landing – perhaps a little too fast – right away. I was thrilled. Three more flights that day rekindled my enthusiasm for twin-engine flying. A low fly-by is mandatory before every landing. This is to visually check that all three legs of the landing gear are extended.

The model also excels at simple aerobatics. Large loops are wonderful to watch, as are slow and fast rolls. Slow flybys with flaps set are a feast for the eyes. Rapid low-level flights thrill the eyes and ears. And most importantly, if you fly too slowly, the long fuselage nose simply dips down. It was impossible to provoke a tip-over over a wing tip. The designer has also done an excellent job in terms of aerodynamics. I set the flight time to around 12 minutes and still had around 30 percent battery capacity left.

I made around 40 flights with the ‚Piston Twin' in the first half of the year. The model also coped well with windy weather. My personal highlight was, of course, the flights at the Model Flying Ranch in Spain. Taking off and landing on the large hard runway is an unparalleled pleasure. I am delighted with this beautiful model and already have a two-metre wingspan 'DC-3' on my workbench. But that's a new story ... ■

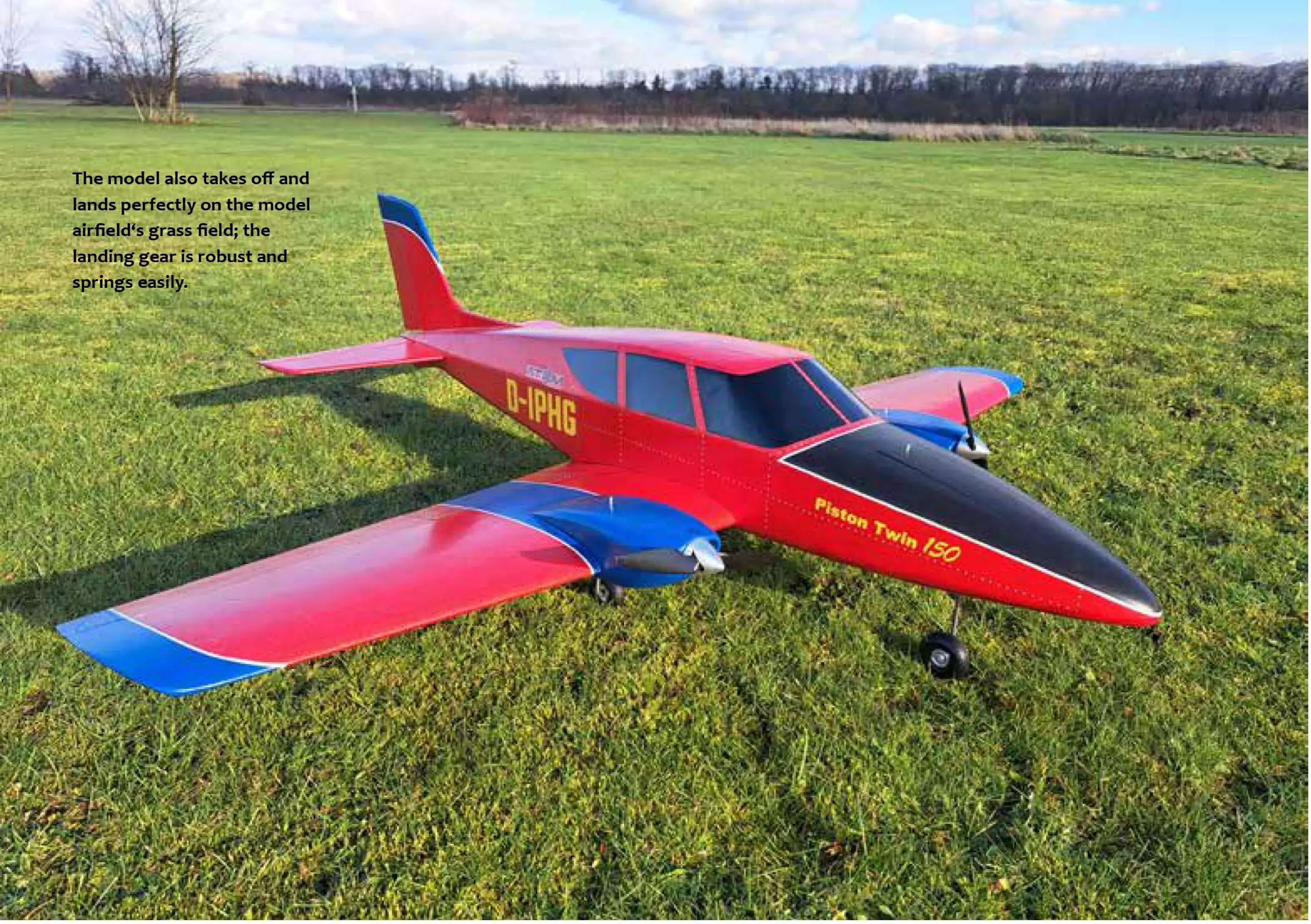
Philipp Gardemin

05
CHASERVO

06
PowerBEAST
C40

07
PowerBEAST
C40

05 I 06 **For the RC equipment, we deviated from the manufacturer's recommendation and used 'DS-115' servos from CHA and 'Powerbeast 40' controllers from Composite RC Gliders.**
07 **The installation of the drive units was so perfectly prepared by the designer that no adjustments had to be made.**



The model also takes off and lands perfectly on the model airfield's grass field; the landing gear is robust and springs easily.

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THE ALL-ROUNDER

THE ‘SCIROCCO L’ FROM ROBBE

Fans of the Volkswagen car brand will prick up their ears, but in this case the ‘Scirocco’ is a powerful electric glider. Wilfried Kamps took a close look at the full GRP model together with his two colleagues.

“The ‘Scirocco L’ is a high-performance model,” emphasises Robbe in its announcement of the model. My colleagues Stephan and Ralf and I are curious. Which one of us is this the ideal aircraft for? Stephan is the aerobatic pilot, Ralf likes the dynamic flying style and I am more of a leisurely thermal flyer.

But first we looked at the model‘s wing profile, an ‘HN-354’. This profile, designed by Austrian Norbert Habe, had already been used on HLG and DLG models. It was later discovered in F3B sport. The 2003 F3B World Championship in Kirchheim/Teck (Germany), for example, was won by Swiss pilot Andreas Böhlen ‘Supersonic’ from Aero Sport Becker. The model was profiled with the ‘HN-354’. It is considered the successor to the ‘RG-15’ profile. The ‘HN-354’ is definitely still one of the current F3B profiles, even if the camber seems a little high given today‘s trends. You just have to use a little more ballast to compensate for the difference. The excuse that you can‘t compete because of 0.2 per cent more camber can be safely dismissed. Adjusting a model to the day and the weather is such a complex matter that such small differences in profiles are secondary. You just have to avoid making the mistake of adjusting your own model in the same way as your competitors with lower or higher camber. Sometimes this requires a little luck, but first and foremost a lot of experience in order to be able to correctly assess wind, weather and thermals. In short: the ‘HN-354’ is still a high-performance all-round profile for F3B models.

Back to the ‘Scirocco’: fun is our main priority; none of us are competitive flyers. The personal feel-good factor with the model is important to us. It was clear from the moment it was delivered that every single part was well made. The Scirocco was quickly assembled and ready to fly. We immediately noticed the very clean finish and paintwork, as well as the play-free linkages. The plug connections for the aileron and flaps servo cables were also neatly soldered. The motor bulkhead was cleanly and securely glued into the fuselage. We also liked the countless little details, such as the discreet recess for the release wedge on the root ribs of the outer wings. It was also impressive that the outer wing sections weighed exactly the same, at 582 grams. In short, our first impression was very positive. The servos (4x ‘FS 128 HV MG’ and 2x ‘FS 335 HV’) and drive (‘Ro-Power Torque 4356’ with 16 x 10 inch folding propeller) were already installed. We made one small change or addition: we cut a recess into the mounting board of the flight battery for the XT90 plug of the controller.

scirocco
robbe

Three men and their model: Ralf, Wilfried and Stephan have taken on the ‘Scirocco’.

Every single component was inspected, here for example the glued-in motor bulkhead and the backlash-free rudder linkage.

We decided to first make all the settings as recommended by Robbe. We used the 'RO-Control 6-80 V2' as the controller. It can deliver around 80 amps and offers a switch BEC with a continuous load of five amps. Robbe recommends a 4s LiPo with a capacity of four ampere hours as the flight battery.

With this configuration recommended by Robbe and weighing exactly 4.5 kilograms, we were ready for the maiden flight. With Stephan at the controls, the 'Scirocco' lifted off gently and powerfully from the launch trolley. The 4s flight battery proved to be completely sufficient for a rapid climb. After 15 seconds, the model had reached an altitude of 150 metres. With all flaps in strake, the model flew straight ahead. Only when turning did it quickly become apparent that the rudder deflections (12 mm) were too small. We increased them to 16 millimetres. We checked the centre of gravity (94 mm) with a banked turn. It turned out that it could be moved further back. Robbe specifies 94 to 100 millimetres, but we finally settled on 98 millimetres. We then checked the thermal and speed settings. The rudder deflections specified by Robbe proved to be spot on. We also adopted the butterfly position as recommended.

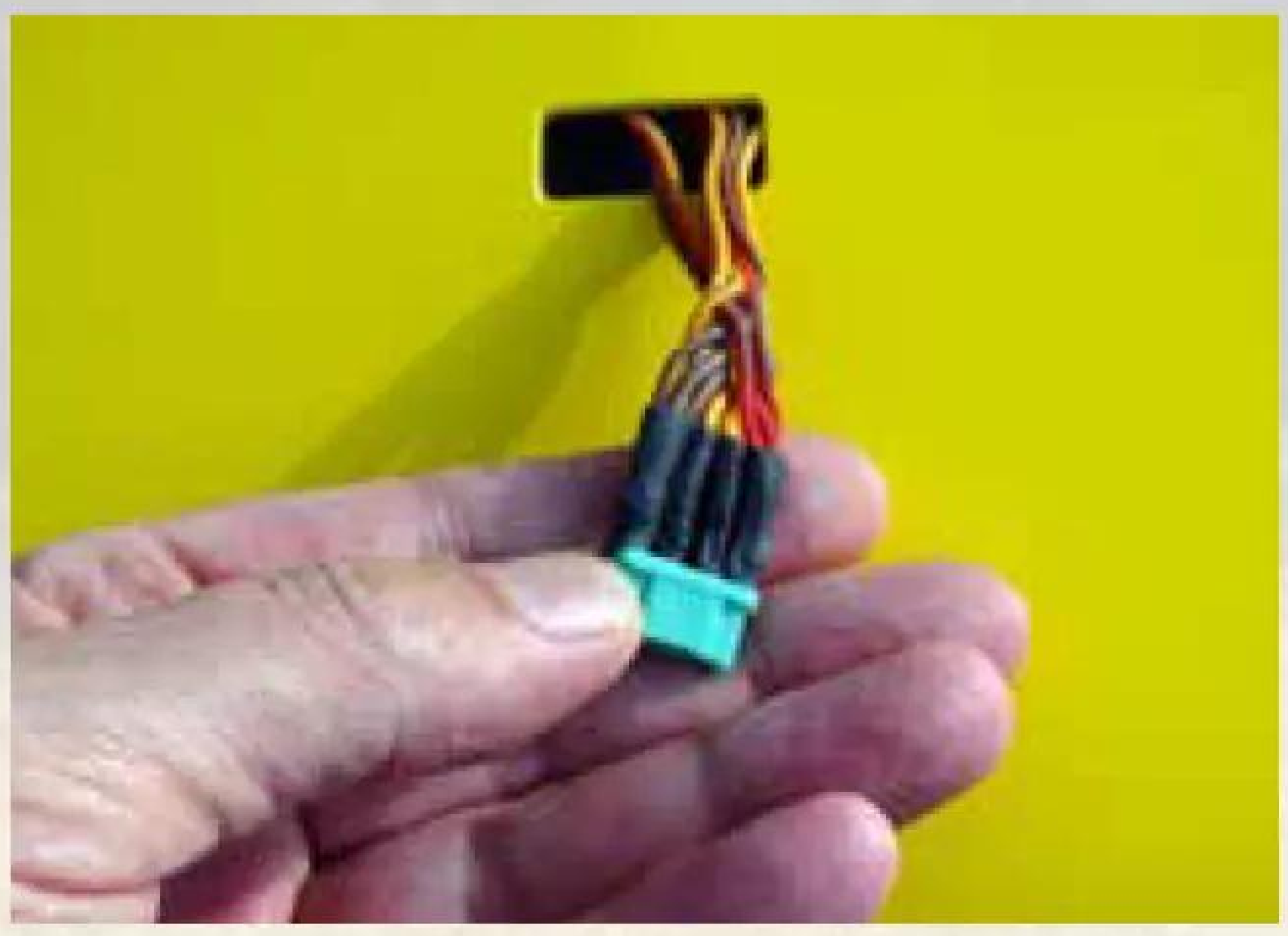
All three test pilots then took off with the same configuration. After everyone had made a few take-offs, it was time for the fine adjustments for each of us. Personally, I didn‘t change much. Only during take-off did the model rise a little too much, so I added a little elevator. I also added a little more elevator to the butterfly position, because I find it more comfortable to pull the elevator than to push it. Further flights in different weather conditions followed. In stronger winds, the larger deflections on the rudder proved to be very helpful. When landing, half a butterfly position is now sufficient. The 'Scirocco' quickly felt at home in thermals, even without the thermal position! But the model wants to be flown and climbs much better when I increase the speed slightly.

I had a week of fun with the 'Scirocco' and then passed the model on to Stephan for a week. He adopted the increased elevator input I had used during take-off and in the butterfly position. He also added the flaps (-2 and +3 mm) to the aileron deflections to increase manoeuvrability. Stephan was also impressed by the thermal characteristics of the 'Scirocco'. But he couldn‘t stand circling for long and seamlessly transitioned to aerobatics in the speed setting. The model converted the speed cleanly and accepted all control deflections willingly. The addition of the flaps proved to be very helpful during roll manoeuvres. Stephan had thus found his settings for the model for dynamic flying.

In the third week, the 'Scirocco' went to Ralf. Although he is not into classic aerobatics, he does like fast flybys and turns, so he decided to adopt Stephan‘s settings and immediately felt very comfortable with them. He assigned the addition of the flaps to the aileron deflections to a switch.

The model was carefully assembled, the plug-in connections fit perfectly.

The accuracy of the spinner contour was impressive.



The plug connections were neatly soldered.

The servos in the fuselage were neatly installed and the linkages were smooth.

There is enough space under the support board for the flight battery to accommodate the motor controller. We made the recess for the 'XT90' plug for connecting the battery ourselves.

After everyone had made at least 20 take-offs in different weather conditions, we exchanged our experiences. We considered whether to test the version with the 5s flight battery. However, this would have meant that the motor would certainly have been overloaded with the 16 x 10 inch propeller supplied. A 15 x 8 inch propeller would be a better choice here. Since Robbe recommends either 4s or 5s batteries, the use of a different propeller should be noted. In the end, we did not make the conversion, as we found the 4s version to be sufficient and perfect for the model.

The 'Scirocco' is a highly recommended electric glider for the three of us and our different flying styles and requirements. The model is in its element both in thermals and during dynamic aerobatic manoeuvres. It is very cleanly finished and well thought out in every detail. We consider the price-performance ratio to be reasonable. The Scirocco is an all-rounder that is sure to give every pilot a lot of fun. ■

Wilfried Kamps

FACTS

'Scirocco L' by Robbe

A four-metre all-rounder

Wingspan	4,000 mm
Length	1,710 mm
Weight	4,500 g
Price	**1,799.99 euros**

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The launch trolley was used for the maiden flight.

Hand launching the model is also no problem with the 4s drive battery.

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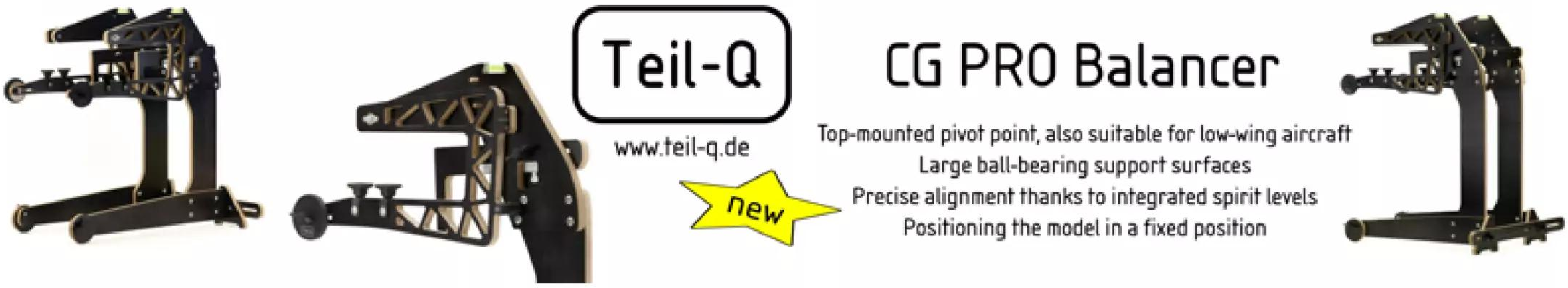

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Preview

A wingspan of 4.3 metres, a length of 2.15 metres and a weight of 29.6 kilograms are the result of 500 hours of construction. Patrick Trauffer has created a truly extraordinary electric motor model aircraft with the 'Dolphin XXXL'.

The gliding exhibition in Schwabmünchen (Germany) will take place from 18 to 20 July. The AUFWIND team will be there and will report in detail on the most interesting innovations and events from the gliding scene.

The 'ASW-15' is also one of the most popular glider types in model making. The model from Jamrich Models in Slovakia has a wingspan of only 1.75 metres. Tobias Misterek built and flew this little beauty.

There are also impressive events taking place internationally. AUFWIND was at the Weston Park Model Airshow in Great Britain, at the World RC Soaring Festival in the USA and in Italy at Monte Cucco.

In addition, interesting models will be presented again, Gerd Giese has tested the CHA servo 'HV75' and Frank Mehlberg has taken a close look at the innovative launch trolley from Schambeck. And much more.

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R10

Advanced 10-channel Twin 2.4GHz receiver with S.BUS input and output ports (up to 24 channels) with precision integrated telemetry. It is also available with an integrated stabiliser with high-precision sensors and various user-configurable stabilisation modes.

#KAV18.10010 - **KAVAN R10**	**75.9 €**
#KAV18.10010S - **KAVAN R10 Stabi**	**102.9 €**

#KAV16.21522 - **KAVAN MicroVario** **59.9 €**

Ideal accessory for every glider - miniature altimeter/variometer with 0.1m resolution compatible with JETI Duplex EX, Multiplex MSB, Graupner HoTT, Futaba S.BUS2 telemetry systems. Dimensions 15×9×4 mm, weight 2 g, power supply 3,5–12 V.

KAVAN
MICRO VARIO

KAVAN®

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